

16 AUG 1950 JULY 1, 1950

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Germ-Free World

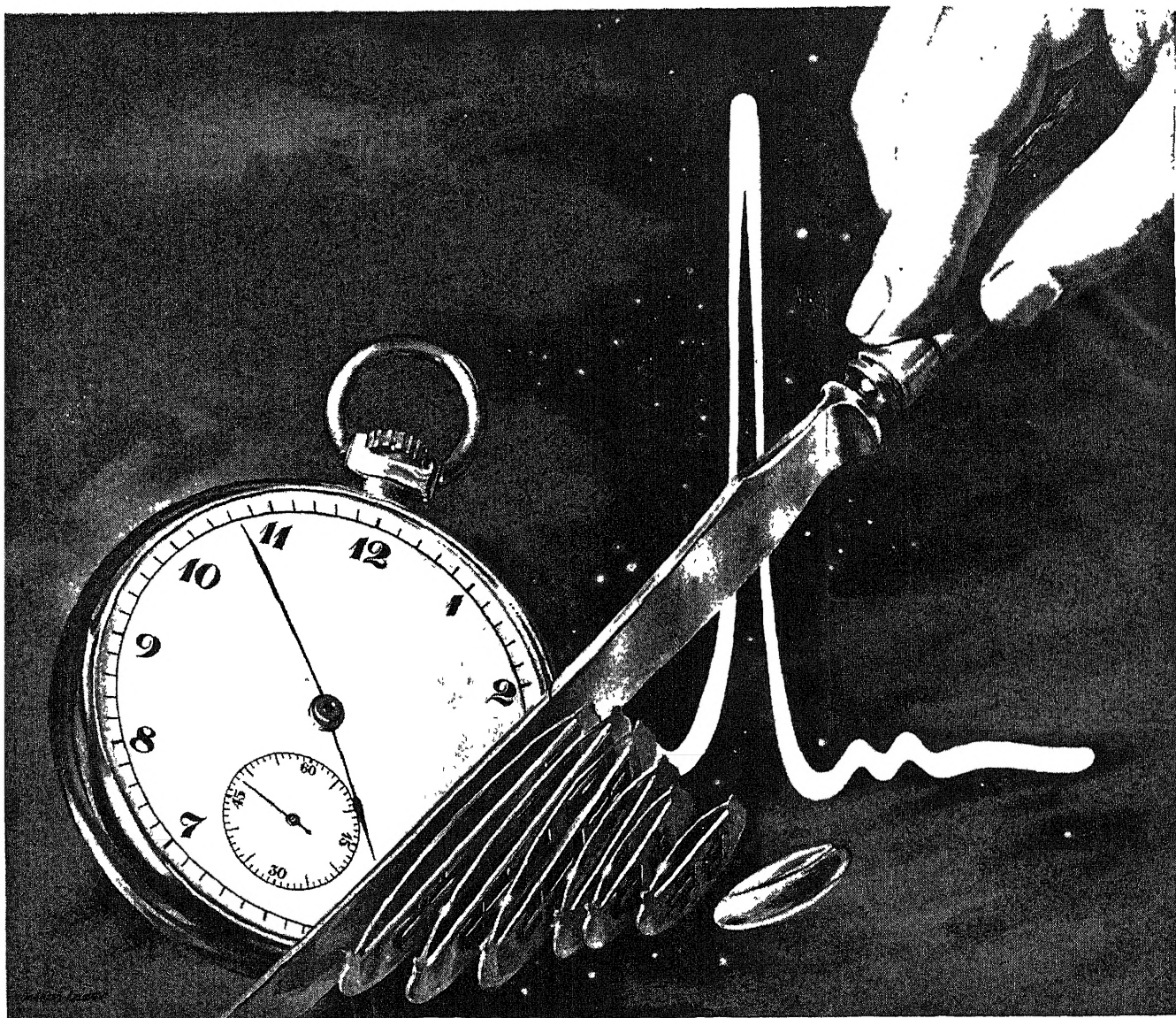
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VOL. 58 NO. 1 PAGES 1-16



New RCA electron tube "freezes" movements that occur, and are ended, in millionths of a second!

How to "see" a super fine slice of time!

Now scientists at RCA Laboratories work with slivers of time too infinitesimal for most of us to imagine. Their new electron tube, the Graphechon, makes it possible.

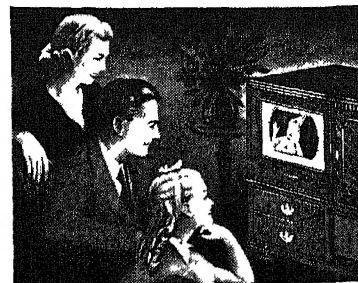
For instance, in atomic research, a burst of nuclear energy may flare up and vanish in a *hundred-millionth* of a second. The Graphechon tube oscillograph takes the pattern of this burst from an electronic circuit, recreates it in a slow motion image. Scientists may then ob-

serve the pattern of the burst . . . measure its energy and duration.

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* * *

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Research like that which gave us the Graphechon tube accounts for the superiority of RCA Victor's new 1950 home television receivers.



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GERIATRICS

Germ-free Life Is Longer

How long life can last when not subjected to the devitalizing fight against germs will be studied in the "germ-free" laboratories at Notre Dame.

See Front Cover

➤ HOW long will life last and death be postponed through freeing the living body of its constant battle against germs? That is the next great investigation to be tackled by Dr. James A. Reyniers, director of Notre Dame's "germ-free" laboratories in a new building just dedicated.

Already evidence has piled up, during his quarter-century of pioneering a germless environment, that aseptic animals do have unusual longevity and that freedom from infection pays off in longer vigor and tissues slower to age.

Few of the white rats, the favored animal in Notre Dame's germless microcosms, have a chance to grow really old because they are in such experimental demand. Now Dr. Reyniers hopes to dedicate enough of his precious population to allow them to die natural old-age deaths.

"It will be a great experience to see a germless rat become senile and die naturally," Dr. Reyniers stated. "We must be ready to carry on our experiments for five years although we know that most laboratory rats are old at three years."

The living cells in the rats and chickens reared in the LOBUND germ free tanks seem to remain more "juvenile" in appearance. In experiments elsewhere antibiotics fed to animals even when they are not sick have increased growth.

What is learned from germless rats may allow scientists to speculate on how to apply such discoveries to prolonging human life, not by removing all germs from our environment, but by other devices that may accomplish a similar effect.

In the latest Reyniers device for raising germless animals, a human being does live among them in a giant tank, but he is a "diver" who is clad in plastic suit and mask, showers in germ-killing liquids and plunges through an antiseptic pool to enter the aseptic world for servicing and measuring animals in several dozen cages.

The front cover of the SCIENCE NEWS LETTER shows the "diver" entering the germ-free animal colony after having passed through the antiseptic germicide trap. Air is furnished the attendant through a hose as though he were under water.

This largest germ-free apparatus so far built will be used to provide a constant supply of the animals for many experiments that the laboratories are being asked to do for government, other universities and industries.

The real effect of radiation upon the

living organism, a prime question in a world threatened by the atomic bomb, will be investigated. Radiation sickness, such as occurs after exposure to X-rays and atomic radiation, seems to be promoted and accelerated by infection. The Atomic Energy Commission and the Office of Naval Research, to aid atomic defense plans, are supporting a program that will discover the effects of radiation upon animals kept away from germs.

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MEDICINE

Flicker Test for High Blood Pressure

➤ A FLICKER test for diagnosing high blood pressure and some forms of heart disease, such as angina pectoris, was announced by Drs. Louis R. Krasno and A. C. Ivy of the University of Illinois College of Medicine of Chicago, Ill., in a report to the American Heart Association.

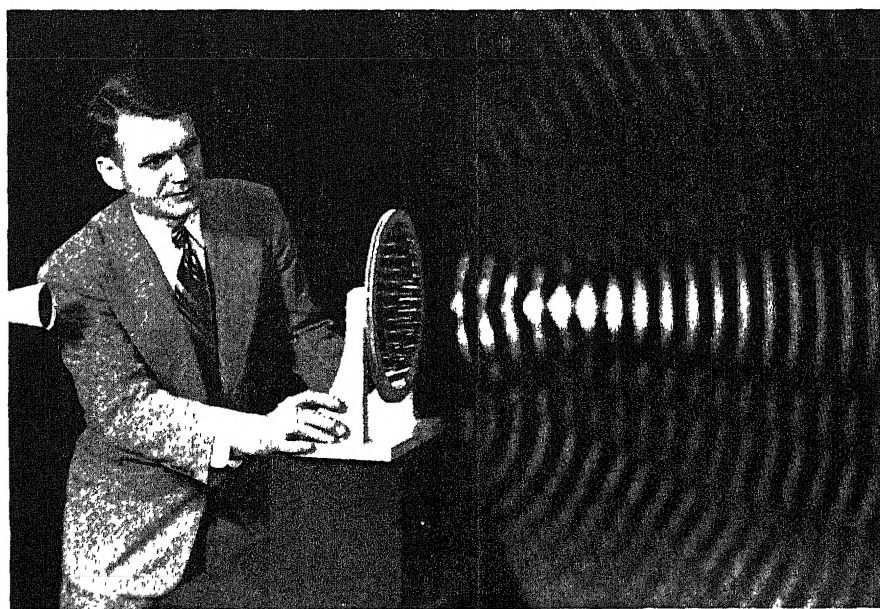
The test may even, the scientists hope,

be able to detect persons who may later develop high blood pressure and coronary artery disease but who do not show symptoms detectable by any other means. Such an early diagnostic test, if successful, could mean longer and healthier lives for these persons.

The test is made with a flicker photometer, or flicker meter, specially devised for use in the physician's office. The patient sits in front of a box with a frosted glass. Behind the glass a light flickers. The speed of the flicker is controlled by the doctor, and the object of the test is to determine when the flicker is so fast that the patient sees a continuous light. This is called the flicker fusion threshold, or F. F. T. for short. For most normal persons this is when the light flashes 2,400 times a minute or 40 times a second.

Persons with high blood pressure are known to have changes in the blood vessels of the retina of the eye. These changes are probably preceded by a spasm of the tiny blood vessels. And because of the narrowing of the blood vessels, the eyes get less oxygen and presumably therefore would not see the flickering light as a continuous light at the same rate of flicker as made it seem continuous to normal persons. Their F. F. T. would be abnormal.

Nitroglycerin, one of the drugs used in angina pectoris, dilates blood vessels. If, the scientists reasoned, this and other blood vessel dilators would relieve the spasm or physiological hypertonus of the little arter-



PATTERN OF SOUND WAVES—The focusing effect of an acoustic lens on sound waves emitted from the horn at left is demonstrated by F. K. Harvey who along with W. E. Koch developed the new technique. It will provide a useful means for studying the sound wave field of telephone receivers and other communications equipment. A tiny microphone and a 110-volt neon lamp are mounted on the end of a beam which swings vertically through the wave field and at the same time is moved horizontally away from the lens. The pattern above was produced during a time exposure of about ten minutes.

ies in the eyes, and improve the oxygen supply, the flicker fusion threshold, or F. F. T., would improve. So in the test, the F. F. T. is determined without any drugs, and then after nitroglycerin has been put under the patient's tongue.

In known cases of high blood pressure and coronary heart trouble, the test has been 98% accurate, Drs. Krasno and Ivy reported in the heart association's official journal, *CIRCULATION*.

MEDICINE

Spasm Rare in Polio

➤ SPASM of skeletal muscles, often reported an important feature and a cause of pain in poliomyelitis, broken bones and backache, occurs very rarely in these conditions, it appears from research reported in the *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* (June 17) in Chicago.

The studies, by Drs. Alex Harell and Sedgwick Mead and Miss Emily Mueller, registered physical therapist, of Washington University School of Medicine, St. Louis, involved taking records of electrical activity of muscles.

In only two out of more than 100 patients with acute polio at St. Louis City Hospital during the 1949 epidemic did the electrical activity show a condition of muscle spasm. Neither patient complained of pain, either at rest or when moved.

Spasm could be detected in "only an inconsequentially small number" of the patients with polio, low back pain and broken bones, the St. Louis scientists report. They believe that the clinical diagnosis of spasm in such conditions will be wrong in a large percentage of cases.

Spasm in skeletal muscles they define as "a reversible state of sustained, involuntary contraction, accompanied by muscular shortening and associated with electrical potential changes."

The scientists tried, on themselves, the

They believe the test should be furthered to determine its value for: 1. diagnosing heart trouble in cases where other tests give uncertain results; 2. for detecting incipient high blood pressure and coronary artery disease; 3. for determining whether a certain dose of a blood vessel dilating drug is actually entirely counteracting the blood vessel spasm condition in a patient.

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experiment of injecting into their muscles small amounts of a salt solution. This causes a "burning, tearing pain which rises to a climax and subsides in about five minutes." Records of electrical potentials from muscles during these experiments, however, showed no signs of muscle spasm.

There seems, they conclude, to be no specific cause and effect relation between spasm and pain. They urge more thoughtful use of the term, differentiating it carefully from spasms, spasticity, tonus, contracture, cramp and rigidity.

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MEDICINE

Advances of Equipment, Funds to Fight Polio Made

➤ ADVANCES of emergency funds and emergency shipment of equipment for polio-fighting from the National Foundation for Infantile Paralysis in New York to local chapters have already begun even though the polio season is barely starting.

Almost a quarter of a million dollars has been advanced since the first of June to chapters whose March of Dimes' funds have been depleted by the demands of rising numbers of polio cases in their areas.

Emergency shipments of equipment during the week ending June 10 included: 13 respirators (iron lungs), five hot pack machines, one suction machine and 480 pounds of woolen materials used in hot packs. Largest shipments of respirators went to Texas and California.

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There are plenty of wild plants suitable for eating as greens, included are dandelions, watercress, stinging nettle, marsh marigold, dock, wild onion, lamb's quarters and many others.

SCIENCE NEWS LETTER

VOL. 58 JULY 1, 1950 No. 1

44,900 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W. Washington 6, D. C., North 2255. Edited by WATSON DAVIS

Subscription rates. 1 yr., \$5.50, 2 yrs., \$10.00, 3 yrs., \$14.50, single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address. Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago State 4439.

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Photographs: Cover, Bruce Harlan, University of Notre Dame; p. 3, Bell Telephone Laboratories; p. 5, Westinghouse Electric Corporation; p. 6, Lee Weber, Hollywood Pictorial Service; p. 7, National Institutes of Health, p. 16, Union Carbide and Carbon Corporation.

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PUBLIC HEALTH

What is wrong with modern housing? p. 6.

That homosexuality is a thing of gradation and that many socially significant persons have sexually taboo items in their history are factors to be considered.

Dr. Kinsey says: "You have correctly interpreted the data which you are using from our book. Certainly there is no question that the reality of the total situation needs to be drawn to the attention of the country. Hysteria thrives best when only a small segment of the picture is understood."

► THE SENATE subcommittee investigating employment of "homosexuals and other moral perverts" by the Federal government had better read the Kinsey report before it goes very far

Dr. Alfred C. Kinsey and his associates found, for instance, that 4% of the white males of the country are "exclusively homosexual throughout their lives after the onset of adolescence" (p. 651, *SEXUAL BEHAVIOR IN THE HUMAN MALE*, Kinsey, Pomeroy, Martin, W. B. Saunders Company.) If this figure can be applied to the 1,419,674 male Civil Service employees, it means that 56,787 Federal employees are "exclusively homosexual." If it is legitimate to apply the figure to the white male members of Congress, it would mean that 21 Senators and Representatives are "exclusively homosexual."

The committee will have to wait until the publication of Dr. Kinsey's next book to discover what percentage of the better than 400,000 female Civil Service employees is, in his term, "exclusively homosexual."

The Senate resolution authorizing the investigation does not define the terms "homosexual" and "other moral perverts" used in the resolution. Dr. Kinsey declared (p. 650) that "any question as to the number of persons in the world who are homosexual and the number who are heterosexual is unanswerable." It became necessary for him to devise a table of seven categories of gradations of sexual activities ranging from the exclusively heterosexual to the exclusively homosexual (p. 639).

The investigation is being held because some members of Congress believe that employment of "homosexuals and other moral perverts" is a security risk in that such persons might be subject to blackmail by Communists.

If that is true, the subcommittee will be interested not only in that 4% which is "exclusively homosexual," but also will have to take an interest in persons who fall into other categories in Dr. Kinsey's table of gradations.

If one homosexual contact is enough for a Communist blackmailer's purposes, then, assuming again that Dr. Kinsey's figures can be applied to Civil Service employees and members of Congress, 37% of them are

poor security risks for that reason. This would work out to 525,279 male Civil Service employees and 192 white male members of Congress.

Dr. Kinsey states (p. 650) that "37% of the total male population has at least some overt homosexual experience . . . between adolescence and old age."

According to Dr. Kinsey (p. 650), 13% of the white male population falls into the three categories showing the greatest frequency of homosexual contacts. "That 13%," he states, "has more of the homosexual than the heterosexual for at least three years between the ages of 16 and 55." Again assuming that these figures are applicable, that would mean that 68 members of Congress and 184,558 Civil Service employees fall into the higher brackets.

A more thorough analysis of the educational, social and economic backgrounds of the members of Congress and Civil Service employees might result in figures which are higher or lower than those above. However, Dr. Kinsey states (p. 201), "Many of the socially and intellectually most significant persons in our histories, successful scientists, educators, physicians, clergymen, business men and persons of high positions in governmental affairs, have socially taboo items in their sexual histories and among them they have accepted nearly the whole range of so-called sexual abnormalities."

The subcommittee will also investigate "the preparedness and diligence of authorities of the District of Columbia as well as the appropriate authorities of the Federal Government, for the protection of life and property against the threat to security inherent in the employment of such perverts by such departments and agencies."

At another point in his book, Dr. Kinsey states (p. 665), "The police force and court officials who attempt to enforce the sex laws, the clergymen and business men and every other group in the city which periodically calls for enforcement of the laws—particularly the laws against sexual 'perversion'—have given a record of incidences and frequencies in the homosexual which are as high as those of the rest of the social level to which they belong."

If the experience of either the Army or the Navy during wartime is any criterion, it is highly unlikely that the subcommittee can either discover very many homosexuals in the government or devise methods of screening homosexuals by the Civil Service Commission.

According to Dr. Kinsey (p. 621), Selective Service boards and Armed Forces

sources give a total figure of about 1% of our wartime military strength officially identified as "homosexual." The Kinsey figures show nearly 30% of men of the age group included in the Armed Forces as having some homosexual experience at that period in their lives.

"The most obvious explanation of the very low figures of the Armed Forces sources," Dr. Kinsey went on, "lies in the fact that both the Army and Navy had precluded the possibility of getting accurate data on these matters by announcing at the beginning of the war that they intended to exclude all persons with homosexual histories. Consequently few men with any common sense would admit their homosexual experience to draft boards or to psychiatrists at induction centers or in the services."

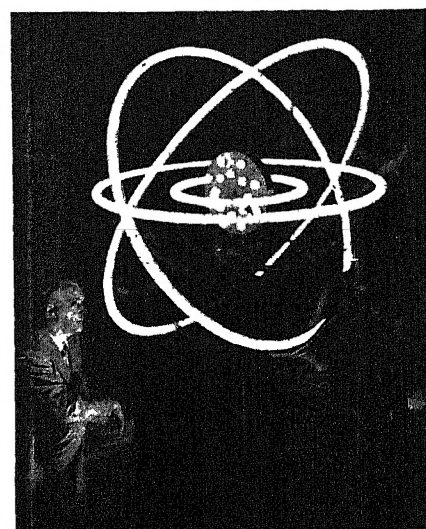
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MEDICINE

Cortisone Available Early in July

► CORTISONE, famous anti-arthritis hormone, will be available to patients in about 6,500 hospitals throughout the United States starting early in July. These hospitals are registered by the American Medical Association and meet certain requirements as to technical facilities and medical supervision.

The drug, under the trademark "Cortone," will be delivered to these hospitals



GARGANTUAN ATOM — The model atom, a feature of the Theater of the Atom, part of the 1950 Chicago State Fair, consists of eight light-bulb "electrons" that swing in circular orbits around a disk-like nucleus where protons are represented by red bulbs and neutrons by blue bulbs. Any atom in the atomic scale up to and including oxygen can be reproduced with this model.

in packages of three vials at a cost to the hospital of \$28.50 per vial, Merck and Co., Inc., announce. Each vial contains 300 milligrams of Cortone. The \$28.50 per vial

price is equivalent to \$95 per gram. When first made available to qualified clinical investigators, the price was \$200 per gram.
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PUBLIC HEALTH

Housing Now Lacks Space

➤ MANY modern homes are from 20% to 50% substandard in that important factor for mental health, space, the American Public Health Association's Committee on the Hygiene of Housing finds.

"During the past half-century, our progress in home sanitation, in heating and ventilation and in improved household equipment has been revolutionary," Dr. C. E. A. Winslow, chairman of the committee, declares. "In the same period, however, we have been retreating in space provisions to an almost equally phenomenal extent. Normal and happy and fruitful family life is not possible without a reasonable modicum of space."

"As one drives through the suburban areas, it is often difficult to determine which is the house and which the garage."

Minimum total floor areas adopted by the committee are for one person, 400 square feet; for two, 750; for three, 1,000; for four, 1,150; for five, 1,400; and for six, 1,550.

Reason for much of the substandard space provisions of modern housing, Dr. Winslow points out, has been "the desire to provide housing so urgently needed in

a period of abnormally inflated living costs.

"This is a reason but not a valid excuse for substandard space," he declares.

On the mental health aspects of space in homes, Dr. Winslow and the committee point out that the average community must provide almost as many hospital beds for mental and nervous diseases as for all other types of diseases taken together. And, he states, the "frustration which results from overcrowding, conflict between the desires and needs of various members of the family, fatigue due to performance of household duties under unfavorable conditions—these are health menaces quite as serious as (if less obvious than) poorly heated rooms or stairs without railings."

"The sense of inferiority due to living in a substandard home is a far more serious menace to the health of our children than all the insanitary plumbing in the United States."

The committee's report is published by Public Administration Service, Chicago, under the title, "Planning the Home for Occupancy."

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PHYSICS

"Sound Bomb" Impractical

➤ SOUND waves can give mice running fits and seizures, can tear the one-celled paramecia to bits, and can cause new genetic mutations in plants as late as the third generation after exposure to the sound.

These results, reported at the meeting of the Acoustical Society of America in State College, Pa., in some ways parallel the deadly effects of atomic radiation. Fortunately there seems to be no practical way of constructing a "sound bomb" that could give out dangerous sustained vibrations.

When exposed to a high pitched whistle of about the same sound pressure as the noise inside an airliner cabin, young mice have fits or convulsions. Older mice are not affected, and there is a considerable variation in susceptibility even among young mice from the same litter, according to Dr. Hubert Frings and Mable Frings who did the research at the Pennsylvania State College.

Paramecia, which are small one-celled animals living in the water and easily visible under a microscope, are destroyed by a sound at a pitch of 1,200 cycles per second.

From the study made by Eugene Ackerman of the Johnson Research Foundation of the University of Pennsylvania, it is believed that the tiny cell, with its contents and elastic covering membrane, has a natural vibration frequency at this pitch. High intensity sounds of other pitches are not nearly so effective in killing the one-celled animal.

Atomic radiation-like plant mutations were described by Prof. Raymond H. Wallace of the University of Connecticut. He said that a variation of from one to twenty-five seconds of exposure to ultrasonic radiation caused a wide variety of modifications in the seedlings of the exposed parent plants. No effects were usually found in the parents. The children and grandchildren have unusual leaf forms, flower forms, greater or lesser vigor, changed color or size. In some lines which have reached the fourth or fifth generation the original mutations have disappeared, while in some other lines modifications not present in the first or second generations have come out in the later generations.

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INVENTION

Long Patent for Device Which Prints Phone Bill

➤ ONE of the longest patents ever issued in the United States was granted recently to three Bell Telephone engineers for a device which can tabulate and print your phone bill automatically.

The bulky document covering the computer was the equivalent of a 366-page book. It included 136 sheets of drawings and 188 columns of printed specifications.

From a continuous coded tape, the new "printer" can translate long series of punched holes into printed bills, tickets, lists or pages of numerical or factual matter. It was designed as part of an overall automatic accounting machine which the inventors say completely eliminates the possibility of human error.

Patent 2,510,061 was issued to David E. Branson of River Edge, N.J., George A. Locke of Glen Head, N.Y., and Tola A. Marshall of Floral Park, N.Y. Patent rights were assigned to the Bell Telephone Laboratories, Inc., of New York.

The volume is a bargain for any one wishing to buy a copy—25 cents is the price of any patent issued by the U. S. Government.

Patent office officials said an even longer patent was issued in 1937 for a weaving loom. It contained 170 sheets of drawings and 292 columns of printed matter.

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SMOG HITS TOBACCO—The effect of smog on tobacco plants is shown above. The leaves of the exposed plant are spotted and mottled gray in color; the leaves of the plant grown in smog-free air are a healthy green. Tobacco, which is especially sensitive to smog, was one of the plants studied in the first year of basic research carried out at California Institute of Technology's Earhart Plant Research Laboratory.

MEDICINE

From Now On: Antibiotics

Untouched diseases caused by viruses may be conquered by chemical treatment. Cheaper synthetic production of antibiotics, as in chloromycetin, will be achieved.

By WATSON DAVIS

Fourteenth in a series of glances forward in science.

► THE chemical conquest of many infectious diseases is virtually complete. The pneumonias and the venereal diseases, to take two prime examples, are no longer the killers and disablers they were before penicillin and other antibiotics were developed.

Once Pasteur had ushered in the new medical era through his revolutionary demonstration of the causative nature of microorganisms, it was a logical hope that substances to kill germs could be found.

It was not so simple as Koch and his followers had hoped when they expected to wipe out tuberculosis with chemicals as a result of having found the guilty germ. It required well over half a century before anything like a general chemotherapeutic agent was obtained.

The sulfa drugs, born of the German chemical industry and developed by British and American researchers, were the first approach to a chemical cure-all.

The first widely used drug from mold, penicillin, was so much more effective that when released for public use after the war it tended to outmode the sulfas.

Other antibiotics, as these curative substances obtained from fungi and soil organisms are called, include streptomycin, aureomycin, and chloromycetin as the ones besides penicillin that are in wide clinical use. Some are drugs of choice in treating various ills, such as streptomycin for some kinds of tuberculosis, and aureomycin for virus pneumonia. More than one antibiotic is effective against some diseases, which is fortunate when the strains of the causative germs grow resistant to one of them.

By the score substances produced by soil organisms, bacteria, yeasts, etc., are being purified and tested in dozens of laboratories in hope of finding newer and better antibiotics.

Already announced as under clinical test is neomycin, a possible running-mate for streptomycin in tuberculosis treatment. Terramycin and bacitracin are two other new antibiotics.

For the future, in this exciting and active development, you may expect:

A. Chemical methods of treating untouched diseases, such as those caused by viruses, including the troublesome common cold, influenza, infantile paralysis and encephalitis.

B. Synthetic production of some of the

known antibiotics, additional to chloromycetin, so far the only one built from chemicals for commercial production. This will probably result in cheaper production and simpler standardization.

C. Discovery of effective combinations of antibiotics, possibly with the aid of other chemicals, for the better treatment of various ills.

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MEDICINE

Blood Disorders from Antihistamine Drugs

► THREE reports of anemia and other severe blood disorders following the use of antihistamine drugs, appear in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (June 24) in Chicago, Ill.

Three cases of anemia of the kind in which the red cells are destroyed are reported by Dr. James J. Crumbley, Jr., of the Graduate School of Medicine, University of Pennsylvania. They are, so far as he can find, the first cases of anemia reported due to antihistamines. Benadryl and pyribenzamine were the drugs in these cases. They had been taken over long periods, Dr. Crumbley reports.

The other two reports, by Dr. A. W. Hilker of Eau Claire, Wis., and Drs. Harrison S. Martland, Jr., and John K. Guck of New York, are of cases of agranulocytosis, a disease in which there are too few white cells in the blood. Weakness, progressing to almost complete prostration, were symptoms in the two cases reported. Both these patients had been taking pyribenzamine.

A few other cases of this serious blood disorder from antihistamine drugs have been reported. Drs. Martland and Guck point out that the toxic effects of antihistamines are not entirely limited to such minor disturbances as drowsiness and slight stomach and intestinal upsets and nervous system disturbances.

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VETERINARY MEDICINE

Southern Cattle Disease Strikes in Michigan

► ANAPLASMOSIS, a long name for a tiny parasite which causes a serious malaria-like disease in cattle, is gradually spreading from the South.

A three-year-old milk cow in Michigan recently became acutely ill with the blood disease, a report to the American Vet-

erinary Medical Association reveals. It was the first known instance of its appearance in that state, veterinarians of Michigan State College say.

Originally discovered in Southern cattle, anaplasmosis has been slowly spreading northward for several decades. Ticks, horseflies and other blood-sucking insects help to spread it. The tiny organisms of the disease invade red blood cells, producing high temperature, anemia and gallsickness.

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MEDICINE

Terramycin Proving Good Mate for Aureomycin

► TERRAMYCIN, one of the newest germ-against-germ remedies, is proving itself a running mate to aureomycin, reports to the New York Academy of Sciences in New York have shown.

Infections in mice following irradiation, whooping cough, pneumonias, urinary tract infections, gas gangrene infections, scrub typhus, Q fever, Rocky Mountain spotted fever, rickettsial pox and amebiasis are among those in which this new antibiotic was reported effective.

Results in influenza seem disappointing. The few patients in whom there has been time to try this new drug got better rapidly, but physicians are not sure how much of a part the drug played. It stops the 'flu virus in chick embryos when very large doses are used, but is not effective in mice.

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INSPECTION TIME—A worker is being checked for radioactivity before he enters the new radioisotope laboratory at the National Institutes of Health of the Public Health Service at Bethesda, Md. One of the few radioisotope laboratories in America equipped for medical research, it is prepared for immediate experimentation in a wide variety of fields.

MEDICINE

New Anti-Blood Clotting Drug Acts within 24 Hours

➤ GOOD results with a new drug for checking dangerous blood-clotting tendency in certain heart and blood vessel diseases were reported by Drs. Irving S. Wright, C. W. Sorenson and Grafton Burke of Cornell University Medical College, New York, at the meeting of the American Heart Association in San Francisco.

Tromexan is the name of the new drug which chemically is the ethyl ester of di-4-hydroxy-coumarinyl acetic acid.

In animal studies and trial on more than 60 patients the drug showed a faster action than the older anti-clotting drug, dicumarol. In most cases the blood showed a response within 24 hours. When the drug was stopped, its effect on the blood stopped more quickly than is the case with dicumarol.

"These are important advantages," the New York doctors pointed out, "for the treatment of acute thromboembolic conditions." This means cases in which a clot plugs a blood vessel.

Trials of the drug have also been made in Switzerland, Czechoslovakia, England and Italy.

Science News Letter, July 1, 1950

AGRICULTURE

Depth Recorders Help Locate Oyster Beds

➤ OYSTER beds can now be located through the use of depth-recording equipment, Dr. A. F. Chestnut of the Institute of Fisheries Research in Morehead City, N. C., reports.

The portable instrument sends out sound waves that are echoed back through the water from the bottom and recorded. By checking the differences in the intensities of the recordings, the kind of bottom surface was determined.

When a hard bottom rising a few feet above the surrounding mud was located, there was the oyster bed. Dr. Chestnut states that it was possible to distinguish shell bottom from hard sand, although scattered oysters lying on hard sand bottom were not easily distinguishable. He reports his findings in the journal, *SCIENCE* (June 16).

Science News Letter, July 1, 1950

MEDICINE

Antihistamines Might Be Good for Heart Disease

➤ THE antihistamine drugs combined with atropine might be good medicine for some kinds of heart disease and should be given a trial, Drs. Durwood J. Smith and Joseph W. Cox of the University of Rochester School of Medicine suggested in a report

to the American Heart Association in San Francisco, Calif.

Atropine is the drug dropped into eyes before examination for prescribing eyeglasses and has other medical uses.

The University of Rochester scientists base their suggestion on studies of heart arteries removed from animals and humans immediately after death and kept alive outside the body.

Two body chemicals, acetylcholine and histamine, both caused constriction of these arteries. Coronary artery constriction occurs in heart trouble. Atropine completely blocked the constricting action of acetylcholine. Antihistaminic drugs completely blocked the constricting action of histamine. Using both drugs, the scientists reasoned, should prevent any constriction of heart arteries in human patients caused by acetylcholine and histamine.

Science News Letter, July 1, 1950

MATHEMATICS-ENGINEERING

Mechanical "Brains" May Translate Languages

➤ MECHANICAL "brains" that will translate languages, create their own instructions and prove propositions in logic were seen as possible results of studies being made in Washington, D.C. on the Bureau of Standards automatic computing machine.

Known as the Standards Eastern Automatic Computer, or SEAC, the machine is the fastest now in operation. It was designed and constructed in 20 months by the Bureau of Standards under the sponsorship of the Air Force.

SEAC is an electronic automatic computer. It uses the binary system, meaning that only two digits—"0" and "1"—represent all numbers and instructions. The Air Force will use the machine to solve problems in the management and administration of large-scale enterprises.

Science News Letter, July 1, 1950

PHYSICS

New Universe: Unlimited Matter in Limited Volume

➤ A NEW kind of universe in which the amount of matter is infinite but its volume does have a limit was described in Mexico City to the American Physical Society meeting by Dr. Carlos Graef Fernandez of the National University of Mexico's Institute of Physics.

A perfectly symmetrical universe is developed by Dr. Graef in what is called a flat space-time. This arises out of Einstein's theory of special relativity as an extension to the cosmos of Birkhoff's theory of gravitation.

This attempt at a new universe picture was one of about a hundred papers presented at the first meeting of American physicists in Mexico.

Science News Letter, July 1, 1950



MEDICINE

Total Prevention of Rheumatic Fever?

➤ THE POSSIBILITY of what might be called total prevention of rheumatic fever by penicillin was suggested in a report to the American Heart Association meeting in San Francisco, Calif.

The report was by Dr. Benedict F. Massell and associates of the House of the Good Samaritan, Boston.

The idea would be to give big doses of penicillin right away to anyone, or at least any child, who gets a strep. sore throat or other hemolytic streptococcal infection. This might save persons who had never had rheumatic fever from getting even a first attack.

Penicillin treatment of strep. infections within the first 24 hours prevented second attacks of rheumatic fever in all of 24 patients, Dr. Massell reported. Among 10 patients who did not get penicillin for throat infections, five had attacks of rheumatic fever. Repeat attacks of rheumatic fever, with its heart-damaging danger, strike on the average 40% to 50% of patients.

Associated with Dr. Massell in the study were: Drs. George P. Sturgis, Richard B. Streep, Thomas N. Hall, Joseph D. Knobloch and Phiny Norcross.

Science News Letter, July 1, 1950

MEDICINE

Blue-Eyed Persons More Apt to Get Cancer in Sun

➤ WARNING to blue-eyed persons, especially those with blue-eyed parents: Better keep out of the sun because you are more susceptible to cancer caused by exposure to the sun's rays than your brown-eyed friends.

A relation between blue eyes and susceptibility to cancer caused by the sun's rays, based on a study of 100 persons, is reported by Dr. A. Fletcher Hall of the University of Southern California Graduate School of Medicine to a special journal on skin diseases published by the American Medical Association in Chicago.

"Observations suggest," he states, "that the more brown-eyed inheritance a person possesses, the better protected he is from the carcinogenic (cancer-causing) rays of the sun. Blue-eyed children of parents are, in general, the most susceptible, but many of these are capable of tanning without repeated burning and thus acquire a fair degree of immunity."

Science News Letter, July 1, 1950

THE FIELDS

NEUROLOGY

Music Brings on Epileptic Fits

➤ A CASE of "musicogenic epilepsy" in which the patient's seizures, or fits, were brought on by hearing music was reported by Drs. David Daly and Reginald G. Bickford of Rochester, Minn., at the meeting in Atlantic City, N. J., of the American Neurological Association.

Only music having great emotional significance for the patient, however, would induce the seizures. Five other patients were sensitive to light, and seizures very like the ones the patients usually had could be brought on experimentally by light stimulation.

The patient with "musicogenic epilepsy" had a period of aphasia, or speech loss, following a music-induced seizure.

Science News Letter, July 1, 1950

MEDICINE

High-Pressure Oxygen for Carbon Monoxide Poisoning

➤ HIGH pressure oxygen as treatment for carbon monoxide poisoning is recommended by Drs. Nello Pace, Enrique Strajman and Elaine L. Walker of the University of California in Berkeley, Calif., in a report to the journal, *SCIENCE* (June 16).

The dangerous gas can be eliminated from the body five times as fast with this method.

The recommendation is based in part on tests with five men and five women who let themselves be exposed to the deadly carbon monoxide gas by breathing it, mixed with air, from a bag for 30 seconds.

The men and women were then seated in a recompression chamber, the ambient pressure was raised to two and a half atmospheres absolute, and they began breathing oxygen from a medical oxygen tank through an A-14 mask. The recompression chamber was one belonging to the Ship Salvage Unit of the San Francisco Naval Shipyard.

The rate of carbon monoxide elimination from the body, the scientists found, is increased about fivefold, from a half-time of over four hours while breathing air to a half-time of about 45 minutes while breathing pure oxygen, corresponding to the fivefold increase in oxygen partial pressure.

Besides the increased speed of carbon monoxide elimination, the high pressure oxygen treatment would also immediately relieve the oxygen deficiency in victims of carbon monoxide poisoning. Blood samples taken from the veins of the men and women

in the experiment were consistently bright red in color during the high pressure experiments, in contrast to the darker color of vein blood drawn under other conditions.

Trial of the high pressure oxygen treatment is recommended where suitable pressure chamber facilities are available. There is, the scientists state, "no evident reason" why the high pressure oxygen method cannot be coupled with standard mechanical resuscitator devices, thereby extending its application to cases where breathing has stopped.

The treatment might also, they suggest, be used in other conditions besides carbon monoxide poisoning where the hemoglobin oxygen transport mechanism has been put out of operation.

Science News Letter, July 1, 1950

PHYSICS

Hand-Written Speech Played Back by Machine

➤ A SLIP of the paint-brush can make all the difference between a soft Southern drawl and the pronunciation of a Brooklyn taxi driver when you are drawing speech by hand instead of using the old-fashioned vocal cords.

Even so, when using the pattern playback developed by the Haskins Laboratories of New York entirely artificial hand-drawn speech is highly intelligible, according to Drs. Franklin S. Cooper, Alvin M. Liberman and John M. Borst of that organization. They spoke at the meeting of the Acoustical Society of America at State College, Pa.

The pattern playback is closely related to the instruments for visible speech, or sound spectrograph, which was developed at the Bell Telephone Laboratories just after the war. The sound spectrograph is a machine that will listen to your voice, and then produce a tape with a recording of the different tones in each of the words of the sentence as you speak it.

The tape comes out marked with broad lines and bands slanting up and down for the different vowels in the words. The pattern playback will take such a tape, read it and convert the marks back into speech. In fact, it will read any marks and convert them into some kind of noise.

Hand-drawn patterns, in imitation of the real speech spectrograms on a tape, when put through the pattern playback, do actually sound like human speech. The drawn out patterns even can be considerably simplified, and still the playback speech is understandable. Parts of the pattern can be left out, or modified to give unusual effects.

Work of this kind, by Pierre Delattre now at the University of Pennsylvania, showed how the French nasalized vowel sounds are a modification of the ordinary vowel sounds. In some cases, nasalization occurs when the hand drawn tape has a curved instead of a straight sound band.

Science News Letter, July 1, 1950

MEDICINE

Hormone Treatment for Undersized Boys

➤ MALE hormone treatment for undersized, puny boys if their slow development is embarrassing them is advised by Drs. H. Lissner and Gilbert S. Gordan of the University of California School of Medicine in San Francisco.

"If they're old enough to be teased, they're old enough to be treated," sums up their opinion as reported to the Association for the Study of Internal Secretions meeting in San Francisco.

They advise the treatment even in boys who could be expected to mature eventually without treatment, in order to forestall feelings of inferiority.

They reported good results with this treatment in 60 boys. All of them grew taller and their weight, muscular development, strength, vigor and morale increased at the same time. There were no harmful effects from the doses of hormone used except two cases of overdeveloped breasts. In one of these operation was necessary.

Science News Letter, July 1, 1950

GENERAL SCIENCE

AAUW Brain Prize Helps Anatomist Confirm Work

➤ BRAIN work won the \$2,500 AAUW award for Dr. Elizabeth C. Crosby, anatomist of the University of Michigan Medical School, and the money will be used for electrical apparatus to give final confirmation on how one region of the brain works.

In accepting the 8th annual achievement award of the American Association of University Women, Dr. Crosby explained that some rather expensive apparatus is needed to clinch some of her results on the brain of primates, including man. She will use her prize money for that purpose.

Science News Letter, July 1, 1950

ENTOMOLOGY

Corn Borer's New Diet: Green Peppers

➤ CANADA'S corn borers, no longer content with Canadian corn, are turning to a Mexican diet. They are showing a damaging liking for green peppers, it is reported in Harrow, Ontario.

A disease known as soft rot, which has become serious in peppers of southern Ontario, has been traced to the larva of the corn borer. When the borers tunnel into the green peppers, they take the soft rot with them.

The resulting loss to some pepper growers, C. D. McKen of the Dominion Laboratory of Plant Pathology reports, has been extremely heavy in the past year.

Science News Letter, July 1, 1950

ENTOMOLOGY

Fight Flies for Fly-Free World

Germ carriers can be beaten by clean-up, new insecticides. Flyless cities are now possible even though some flies have established a resistance to DDT and other insecticides.

➤ **FLY-FREE HALF CENTURY!** Will this be a chapter heading in a future historian's look at the United States of 1950-2000?

A museum placard reading "The Last Fly on Earth" will probably never be written. No human would be around to write it.

But right now, at mid-century, Americans have the weapons to write off the last fly in their homes, neighborhoods or entire cities. Over the past three or four summers, all-out anti-fly campaigns have done just that in many U. S. communities.

As 1950's fly-war season opens, these are the weapons, an arsenal of potent insecticides built around DDT, most of them inexpensive and widely available; public awareness of the bacteriological dangers as well as the aesthetic unpleasantness of seeing a platoon of flies march across the sugar bowl or gravy tureen; and most important, the ability to hit flies where they live, by clean-up and elimination of their breeding places.

The common house fly stands indicted by medical authorities as a menace to public health. It carries germs straight from piles of manure or decaying garbage to the food that you eat.

At worst, its passengers are dysentery, typhoid, diarrhea and TB. At best, its annoyance is an insult to the human race.

Flies Begin as Mass of Eggs

The fly begins as one of a mass of about 130 tiny white eggs. The mother, if she has her choice, will pick a pile of fresh horse manure as her maternity ward. But she has no aversion to the well-filled garbage can whose top you forgot to put back on. Refuse in alleys, souring matter on the city dump, or the old-fashioned outdoor privy are other choice lying-in spots.

The eggs hatch in less than a day, producing tiny larvae or maggots. These creamy-white worms gorge themselves on the food at hand. Three days to a week later, grown to half an inch in length, the maggots crawl to the edges of the manure pile.

There they burrow into the soil and turn into brown, barrel-shaped incubators. Inside each one, an adult fly begins to develop. This is what is called the pupal, or resting stage of the insect.

When the weather is warm enough, (anywhere from three days to many weeks later), the adult fly pushes open the end of this case, worms its way to the surface and is off to your dinner table. The female soon mates, and is ready to lay her first clutch of eggs within days.

From the home-owner's point of view, this rapid life-cycle produces hordes of flies in nothing flat. The prospect of ever winning against the winged legions seems remote. But an essentially flyless city is not impossible.

Clean Back Yard

The work can begin in the back yard. The garbage can should be tightly lidded, and kept that way. Cut grass should not be raked into piles and left to decay. You can urge your neighbor to eliminate that pile of manure in his garden, pointing out that it will do wonders worked into the soil, but if it is left in a rotting heap, fly larvae will call it home.

A community-wide prevention campaign can be initiated in this day and age without using dynamite on City Hall. The city fathers have long since realized that a town without flies means votes. You can do your

part by urging that dumping grounds be covered with cinders or earth and sprayed with DDT several times during the summer.

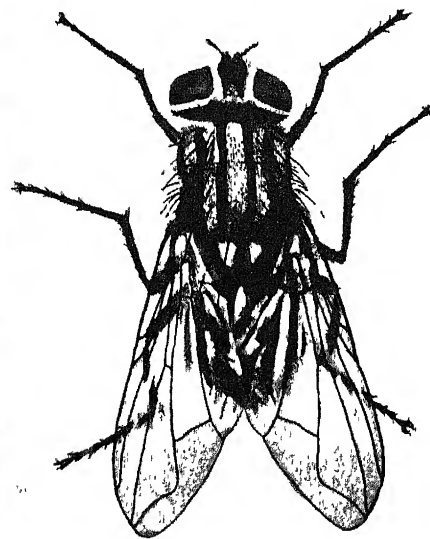
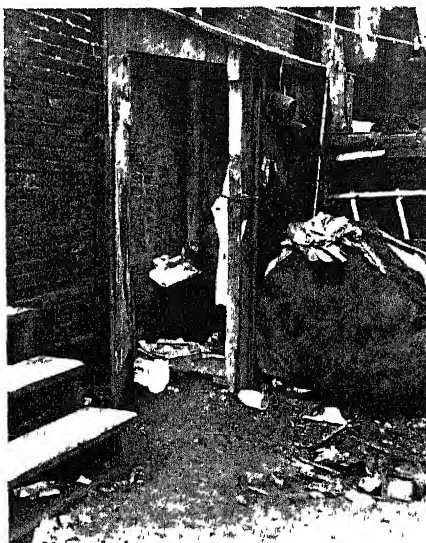
Alleys and areaways behind restaurants, markets or slaughter-houses are not proper places for garbage or fermenting rubbish. The municipal health department is responsible for seeing that these places do not become fly-breeding centers.

Insecticide Strikes

To provide a sudden, untimely death to the flies which arrive at your door, the household insecticides come into the picture. There are two general types: the residual sprays or liquids, which leave a death-dealing film on screens, pillars, window sills and other likely landing strips flies may use; and the aerosols, fine mists which hang in the air and knock down airborne squadrons of flies.

You can use a paint brush or a common household spray gun to put down residual insecticide defenses. Spray or paint all likely roosting places, indoors and out. Of particular importance are the window and door screens and other points where flies will try to get into the house.

These coatings will last from several weeks to several months, depending upon their exposure to the weather. They will not knock over flies as if they carried high-voltage electricity. But any fly that so much as steps on a tiny speck of DDT will begin



FROM RUBBISH HEAP TO ADULT STAGE—Fester spots such as this provide a breeding place for the common housefly. Then after a few weeks the adult fly, as shown above, right, emerges full-grown from his pupal shell.



TO SUGAR BOWL—With taste buds on the ends of his legs, the adult fly likes nothing better than to prance in your sugar bowl.

to reel and stagger in 30 to 40 minutes. Shortly afterward, it will be a "good" fly—a very, very dead one.

The aerosols—or space sprays—deal quick and gratifying death, on the other hand. That is because most of them contain pyrethrum, either natural or the newly developed synthetic variety, as well as DDT. The pyrethrum scores an instant knockdown; the DDT (or other insecticides) delivers the killing punch while the fly is unconscious.

Although the amount of DDT in household insecticide sprays is too small to hurt you, your skin may react to the kerosene solvent which many such sprays employ. For that reason it is always a good idea to wash your hands with strong soap after using any insecticide.

DDT-Resistant Flies

You may find yourself fighting flies which do not bat an eye at DDT. DDT-resistant strains have been popping up in the past several years in widespread parts of the country.

But you are far from weaponless. There are other new insecticides developed since the war which are highly recommended for fly control use by entomologists and public health officials. Among these are chlordane, methoxychlor, gamma benzene hexachloride (also called lindane), synthetic pyrethrum and dieldrin.

All but dieldrin are now on the market. The aerosols come in easy-to-operate cans which produce a death-dealing space spray

at the touch of a button. Under government regulation, manufacturers must print on the label exactly what compounds an insect spray contains—and how much of it.

For the would-be buyer, there is one cardinal rule: *Read the label on the can! Follow what it says.*

Science News Letter, July 1, 1950

CHEMISTRY

Rare Element Crystals Seen As Anti-Virus Agent

➤ CRYSTALS of the rare element, germanium, might be made into an anti-virus agent for disease-fighting, Prof. Eugene G. Rochow of Harvard University suggested at the American Chemical Society's National Colloid Symposium in St. Louis.

The suggestion is based on recent research on compounds of carbon, hydrogen, oxygen and germanium. The compounds are known as organogermanium oxides. Giant molecules of these compounds, which Prof. Rochow calls "germenones," have the property of accumulating or organizing into crystalline arrangements "strikingly similar to the virus crystals formed by such organisms as tobacco mosaic virus," Prof. Rochow reported.

"The virus structures have the ability to reproduce and grow while the 'germenone' crystals do not," Prof. Rochow said, "but the similarity of structure and size indicates further how indefinite is the line between the properties of living matter and the prop-

erties of non-living matter of comparable molecular weight.

"The possibility of having the non-living 'germenone' crystals interfere with the growth of virus crystals, and so inhibit the characteristic functions of the virus, remains to be investigated."

Science News Letter, July 1, 1950

INVENTION

Steering Wheel Cushions Driver in Collision

➤ A TELESCOPING steering column, designed for the much-discussed Tucker automobile, brought patent 2,511,165 to Kenneth E. Lyman of Chicago. Patent rights are assigned to the Tucker Corp., Chicago, Ill.

Parts of the steering wheel column are connected rigidly with one another with regard to rotation, but are designed to slide together like a telescope if pressure is applied to the wheel. A heavy spring keeps the wheel in normal operating position, yet acts as a safety cushion for the driver, should he be thrown forward by sudden impact or deceleration.

Science News Letter, July 1, 1950

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Hints for Writing Science

Telling the public about science and technology has been the work of Science Service since 1921. In those years many scientists, writers, and editors have asked questions that have been answered by the following suggestions, originally compiled about two decades ago.

Don'ts for Would-Be Writers of Science

By the late EDWIN E. SLOSSON
First Director of SCIENCE SERVICE

Don't overestimate the reader's knowledge and don't underestimate the reader's intelligence. He may not know as much as you about this particular thing—let's hope not anyway—but otherwise he may be as bright as you are—let's hope so anyway.

Don't try to tell all you know in 500 words. Leave some over for another time. The clean plate rule does not apply here.

Don't think that because a thing is old to you it is known to the public. Many of your readers are still living in the nineteenth century; some of them in the eighteenth. Anything new to your readers is "news" to them if hung on a timely peg.

Don't leave out the human interest. Your reader is a human being even if you are only a scientist.

Don't forget that your reader is interrupting you every ten lines to ask, "Why?" "What for?" or "Well, what of it?" and if you don't answer his tacit question he will soon stop reading.

Don't think that you can make your topic more attractive by tricking it out with fairy lore or baby talk or irrelevant jokes or extravagant language. Bring out its real and intrinsic interest as forcibly as you can. Set off the red fire if you like, but be sure it lights up the object instead of drawing attention away from it.

Don't say "this discovery is interesting" unless you can prove that it is, and if you can prove it, you don't have to say it.

Don't suppose you must give bibliographical references to all the literature of the subject, but don't fail to give a clue by which the interested reader can get on its trail.

Don't fail to put your best foot forward. Otherwise you may not have a chance to use the other foot. Note the construction of the news story in any first-class paper. It is built up on the same logical system as the symphony or opera overture. The opening paragraph gives in succinct fashion the main point of interest, the gist of the story, just as the first movement of a musical composition expresses the theme or motif.

Don't expect the editor to explain why he objects to your manuscript. He is probably right in his verdict, but if you would make him give a reason for it, he will have to invent one and it would probably be wrong.

Don't back up too far to get a running start. Remember the man who wanted to jump over a hill. He ran a mile to work up momentum and was so tired when he got to the bottom of the hill that he had to sit down and rest. So will your readers. Ninety per cent of the manuscripts that I have handled in 20 years as an

editor would have been improved by cutting off the first page or paragraph. Yet authors, like hens, kick on decapitation.

Don't imagine that you must add a pretty but superfluous paragraph at the end, like the coda of a sonata. The most effective close is to quit when you get through.

Don't shoot in the air. Aim at somebody. You may miss him, but you are more likely to hit somebody else than if you aim at nobody. Look out of your window and note the first person coming along the street. Imagine yourself stopping this man or woman on the sidewalk, and, like the Ancient Mariner, holding his or her attention till you have told your tale to the end.

Don't regurgitate undigested morsels. It is a disgusting habit.

Don't refer to notes or books while writing. Read up on the subject as thoroughly as you can, and take as many notes as you need, then put away all your notes and books out of reach and next day or at least an hour later lay clean sheets of paper on a clear desk and write out what you know about it, in your own way. Afterwards, preferably next day, read over your manuscript critically, verify your facts, correct your data, revise your English and add any essential points, but don't expect the reader to be interested in what is so uninteresting to you that you cannot keep it in mind a single hour.

Don't define a hard word by a harder word. Vladivostok is a hard word, but when a press correspondent arrives at Vladivostok he goes right on inland without stopping to explain that "this is a city south of Khabarovsk and east of Tsisikhhar." So, if you want to say "calorie," say it, but don't make it worse by "explaining" it as "the quantity of heat necessary to effect a rise of temperature of one degree Centigrade of a cube of water each dimension of which is one tenth part of the length of a bar of platinum and iridium alloy lying in the observatory of St. Cloud." If you think you must define the calorie say casually something like this, that 100 calories of energy can be derived from three cubes of sugar or from a small pat of butter, or explain that a man needs to expend 100 calories an hour to keep his body running, and 160 calories if he is working hard.

Don't think you must leave out all the technical terms. Use them whenever necessary without apology, and if possible without formal definition. People are not so easily scared by strange words as you may think. They rather like 'em. Kipling is read with delight by old and young, yet his prose and verse are crammed with technical terms. Having exhausted the military, nautical and mechanical vocabularies, he invented a new and unknown nomenclature for his story "With the Night Mail," and didn't stop to define one of the technical terms. In his "Just So" stories for the kiddies he sticks in long names like plums in a pudding. A Kipling dictionary has been published, but even the editor could not run down all the peculiar words Kipling had picked up. But the ordinary

reader does not need the dictionary. He gets the meaning from the run of the story, for the story is so written that he will get the meaning as he runs. When the Great War (First World War) broke out everybody had to learn a new language for which there was no dictionary. But the war correspondent wrote without hesitation: "At zero hour the barrage was raised and the poilu and the doughboy sprang over the top, sticking their bayonets into the boche." And the man in the street read it without batting an eye, although the sentence contained half a dozen words not to be found in his vocabulary before. But if this sentence were being written by one of our conscientious scientists, he would word it in this fashion.

"At zero hour—to use the military term for the time set for the beginning of an offensive—the barrage—that is to say the line on which the artillery fire is directed—was raised and the poilu—this is a French slang term for soldier, meaning 'hairy' and corresponding to our 'lough-neck' and the doughboy—this is an American slang term for infantryman derived either from the round buttons worn in the Civil War or the 'dobe' huts inhabited in the Mexican War or the pipe-clayed belts of the Revolutionary War or because the Secretary of War was named Baker—sprang over the top—that is to say, surmounted the parapet of the entrenchments—sticking their bayonets—a weapon invented at Bayonne, France, in 1650—into the boche—a contemptuous term referring to the Germans, probably an abbreviation of *caboche* or *blockhead* originally applied to Alsations."

Stories That Should Be Handled with Care

By WATSON DAVIS
Director of SCIENCE SERVICE

Stories on this list should, in general, not be used, at least until they are thoroughly checked and investigated by several competent specialists in the subject. These are not forbidden stories for some of the impossible things of today may become possible tomorrow, but scientific discoveries rarely come nowadays from accident or inspiration. They are usually the result of systematic research of many investigators.

General

Any "secret" scientific or technical process.

Any process or preparation, where the essential element is not disclosed, bearing a coined name.

Announcement of the sudden achievement of "what scientists have long sought for in vain," and rediscoveries of "lost arts."

Complaints of "a conspiracy of silence" against the inventor or other evidence of a persecution complex.

Sweeping claims of any sort

"Supernatural" Stuff

Telepathy and mind reading.

Spirit manifestations of any sort.

Long range weather forecasts in general.

Long range weather forecasts based on animal habits.

Astrologists and horoscopes.

End of the world predictions for the near future.

Evil or beneficial influence of the number 13

Evil or beneficial influence of the number 7.

Evil or beneficial influence of any number.

Stars affecting human events or destinies.

Phrenology.

Numerology.

Predictions based on lines of hand, or shape of nose.

Intelligence or character reading based on size and shape of features, handwriting or hands

Charms, amulets, lucky coins and other such survivals of savagery.

Rediscoveries of lost prophetic books

Animals that "think," "read minds," etc.

Medical

Hypnotic "cures"

Hypnotic treatments by non-medical practitioners.

Mental treatments by others than physicians or psychologists

Universal germ killers

Any absolute cure of any disease

Unauthenticated treatments of cancer, tuberculosis, colds and such diseases

Cancer "cures."

Cures of deafness, blindness or baldness

Doctors who advertise

Cures for "male and female weakness."

Drugs for curing obesity and underweight

Rejuvenation

Electrical treatments for serious disorders.

Electric belts.

Electronic treatments by the Abrams or other such methods

Spinal adjustments.

Whiskey as an antidote for snake bite

Mad stones for snake bite

"Marking" of children by experiences of mother before birth

Determining or controlling of sex before birth

Mineral waters as cures for disease

Cure of rabies by a stone or by shooting the dog.

Physics and Mechanics

Perpetual motion

Machines that produce more energy than they use.

Fuelless motors.

Chemicals that greatly increase gasoline mileage.

Fluids that recharge storage batteries.

Methods of burning water or ashes.

Chemicals that make coal burn hotter.

Rediscovery of supposed lost arts, such as hardening of copper.

Death rays.

Engine stopping rays.

Diving rods.

Intuitive methods of discovering water, oil and minerals.

Transmutation of metals.

Animal and Plant World

Creation of life.

Spontaneous generation of life.

Sea serpents.

Seeds that grow after more than 300 years,

especially that old chestnut about wheat in mummy cases.

Superhuman intelligence in animals.

Prehistoric and gigantic animals living today

Gigantic snakes in temperate zones

"Hearts," "nerves" or other animal-like organs in plants

Inheritance of acquired characters.

Absolute proof or disproof of evolution.

Hybrids between unlike plants or animals

e. g., goat and pig, or cariot and beet

Toads or frogs enclosed for many years in stones or rocks.

Animals (e. g., turtle or frog) living in the human stomach after being swallowed.

Living "Missing Links"

Man-eating trees

Miscellaneous

Discovery of prehistoric men of gigantic or dwarfed size.

Ozone in sea-side, mountain or prairie air, radium water

Messages from or to Mars or other planets, inhabitants of other planets

"Moron" as synonym for "sex offender."

People living to extreme ages, as 115 and 120 years.

Skeletons or mummies of "giants" (more than 7 feet tall).

"Squaring" the circle, trisecting the angle.

Moon's influence on weather, crops or people

Influence of sunspots on animal propagation, death rate, etc.

Children "brighter than Einstein."

Discovery of the secret of the pyramids, sphinx or other ancient monuments.

Discovery and interpretation of ciphers in old books and manuscripts.

Lost continents, such as Atlantis and Mu.

Equinoctial storms

Earthquakes are necessarily accompanied by volcanic eruptions.

Moundbuilders as a "mysterious civilization" (They were just plain Indians.)

About Writing For Science Service

In reply to inquiries about writing for Science Service, the following information is furnished:

Science Service invites the cooperation of competent writers, particularly those who are scientifically trained and engaged in research work. In general, it does not appoint correspondents on part-time or full salary. It does not appoint representatives other than its regular staff. It does not assign particular geographical territory or scientific fields to its correspondents

Science Service material must have the approval of the scientific world and it is expected that those who submit material to us will prepare it with the cooperation and approval of the scientist whose work is being reported.

Science Service syndicates news and features to many subscribing newspapers in all parts of the world. The stories carried on our leased coast-to-coast wire and in our other newspaper reports are used in various parts of newspapers—news columns, editorial pages, Sunday feature sections and daily magazine pages. They are also used in magazines, among them the SCIENCE NEWS LETTER, published by Science

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All news stories should have both news angle and science value. In all but exceptional cases, they should be written in the form, style and length customary in the news pages of a daily paper. Tell the news in the first paragraph or sentence. Usually, news stories are not signed by individuals but "By Science Service"

Three to four hundred words is the preferable length for news stories. A thousand words is too long for the average newspaper column. Look at a daily newspaper and note how few stories are longer than half a column.

News stories begin with a date-line showing the place of origin of news or where written. Thus: WASHINGTON. Copy should be type-written, triple spaced. Put your name and address on your story.

Science Service pays professional and amateur writers whose material proves acceptable.

One cent a word is the minimum rate paid, on acceptance, and more is paid for stories of exceptional value and news interest. It does not pay scientists for coverage of their own researches.

The first consideration in a Science Service story is to tell about or interpret a scientific event. But the news stories must be so well written that large newspapers will use them without rewriting or revision, either in form or language. Tell your story so that those who know nothing about science will understand and wish to read it. Weave in the scientific background that the man in the street does not have. Use simple words. Make your story as graphic as if you were talking about it.

The credit line, "By Science Service," must stand for accuracy of content and comment. Check up facts, figures, names, dates, places, and if you are not an authority on the subject, get your story checked by some one who is. State on the MS. source of information, whether personal interview, letter, magazine, or otherwise. If from a scientific journal, give date and page number. It is necessary that title (Dr., Prof., etc.), complete name and initials, position, and location be given for all persons named. If the person quoted or giving information has had a chance to look it over, so state (Whenever possible all Science Service stories are checked in this way.)

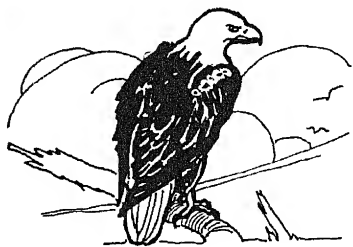
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Science News Letter, July 1, 1950

ORNITHOLOGY

NATURE
RAMBLINGS

Bald Eagle

➤ NEITHER Ben Franklin nor John Audubon, two of the most noted American scientists, thought much of the choice of the bald eagle as the American national bird.

The bald eagle is a handsome, ferocious-looking bird, with his snow-white head and neck above his dark brown body. His habit of choosing a nest site in the clouds, on an inaccessible crag in the mountains or at the top of a towering tree, lends itself to our concept of the bird as a symbol of power and dignity.

But when we come to know him a bit better, as Audubon did, the American eagle does not seem so attractive after all. He is not the wild, fierce, free-hunting bird which Fourth-of-July orators are wont to make him. More often, he is a robber and a carrion feeder, like the vulture.

He does eat meat, to be sure; but if he has a choice, he will take fish—and he is not always fussy about how he gets it.

A favorite trick of the bald eagle, as described by Audubon and by many naturalists after him, is to circle in the air while an osprey, the well-known fish hawk, works below him. The osprey is a fine large bird that can plummet down into the water, snatch a fish from beneath the surface and fly off with it.

When the eagle sees the osprey rise with a catch, he swoops down from twelve o'clock high, screaming his loudest. The osprey, alarmed by attack, drops his fish and dives for safety. That is just what the eagle wants.

He continues his own dive, not after the osprey but after the dropped fish, catches it in mid-air and bears it off triumphantly. A clever enough stunt, this trait of the eagle's, but not a particularly good sign of noble character. And Audubon would be among the first to point this out.

Benjamin Franklin's opinion of the bald eagle was no higher than that of Audubon. Franklin contended that the national bird of the new republic should be a turkey, if the country must have any bird as its emblem.

The gobbler, he pointed out, is just as exclusively American as the eagle, it is a peaceful and a highly useful bird, particularly at Thanksgiving, rather than being piratical and predatory. And the turkey, although it will fight only when its family is threatened, will then do battle against dismaying odds.

But the advice of Franklin and Audubon was disregarded. The bald eagle was enthroned on our national coat of arms and our coins. July 4 became a time to talk

about the great qualities of the fearless bald eagle.

There is no doubt that any eagle inspires the admiration and respect of one seeing him in his natural habitat. And Audubon, if he were here, would chuckle over silver money he might receive. For there are more than a few coins in circulation now which portray, not the bald eagle, but the golden eagle, which is native to the Old World as well as to America.

Science News Letter, July 1, 1950

ENGINEERING

Industrial TV System

➤ ACTIVITIES in factories can now be viewed by the superintendent without leaving his office desk. Classroom doings in the school can be noted from the principal's office. A new industrial television system is the answer. It is small enough and cheap enough for wide usage.

The new system is a non-broadcasting type. Transmission from workrooms to the central office is by wire. The system is capable of transmitting a signal 500 feet over a coaxial cable closed circuit. In factory rooms or other places to be viewed frequently, a camera is kept in fixed position. The camera is operated and even focused from a master unit in the central office. The picture is shown as in a conventional receiver.

The heart of the new system is a camera about the size of a personal-type 16-millimeter movie camera. The key of the camera is a new pickup tube, called a Vidicon, which is only one inch in diameter and six inches long. This is less than one-tenth the size of the Image Orthicon tube used in TV studio cameras.

This new tube, and the industrial television system made possible by it, is a de-

velopment of Radio Corporation of America. The possibilities of the system were demonstrated recently in the City Prison of Manhattan, New York. With it, prisoners were observed during work, relaxation and exercise periods. The prison scenes were reproduced with clarity and brilliance.

A suitcase-size control box is the only other unit required for operation. This combines the power supply, a small synchronizing generator, a video amplifier strip, scanning deflection equipment, and a seven-inch kinescope monitor in a single housing. The entire system operates on ordinary 110-volt, 60-cycle alternating current, and consumes only about one-third the power used by a household electric toaster.

If desired, home television receivers can be adopted for use as monitors. To do this, an additional tube in the receiver is required, together with accompanying resistors and capacitors. In addition to the applications suggested for the system, many others are possible. Important is the viewing of dangerous operations from a safe distance as, perhaps, where radioactivity is concerned.

Science News Letter, July 1, 1950

OCEANOGRAPHY

Earth Has "Spring Fever"

➤ THE daily rotation of the earth on its axis is not as steady and sure as you might think.

Dr. Walter Munk of the University of California's Scripps Institution of Oceanography says there is a number of things that can slow it down or speed it up.

For example, the earth can get "spring fever." There is just enough shift in weight—due to the rising of the sap and growth of leaves, grass and flowers in the spring of the year—to decrease its speed by .02 milliseconds per day. (A millisecond is 1/1000 of a second.)

Winds and tide can slow the earth down, also. Prevailing westerlies cause a loss of 1.5 milliseconds per day, while ocean currents are responsible for a slow-down of .1 millisecond.

There is some evidence to show that even

man's activities on earth—the concentration of buildings in large cities like New York and Los Angeles for example—slightly affect the earth's rotation. Dr. Munk has figured out that if all the automobiles in the United States were driven from Fairbanks, Alaska, to Mexico City at the same time, the earth's rotation would be affected to the extent of 0.00002 milliseconds per day.

Another curious thing, not yet explained, is that seasonal and man-made variations seem more pronounced in the northern hemisphere than below the equator.

Dr. Munk, an associate professor of geophysics, is making the calculations to determine whether it is possible to use accurate astronomic observations in conjunction with the atomic clock, the world's most accurate timepiece, as a means of studying the circulation of the atmosphere.

Science News Letter, July 1, 1950

Books of the Week

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Atlas of Human Anatomy, Vol. I Osteology, Arthrology, Myology, Vol. II Splanchnology, Angiology, Nervous System, Organs of Sense—M. W. Woerdeman—*Blakiston*, Vol. I Approx. 452 p., illus., \$10.00, Vol. II Approx. 580 p., illus., \$10.00 (Set \$18.00). A two-volume set pictorially representing the structure of the bones, joints, muscles, the digestive, respiratory, urogenital, circulatory and nervous systems and sense-organs.

CLINICAL NUTRITION—Norman Jolliffe, F. F. Tisdall and Paul R. Cannon, Eds.—*Hoeber*, 925 p., illus., \$12.00. Covers diagnosis of deficiencies, a detailed discussion of individual nutrients, therapy and prevention. Monograph sponsored by the Food and Nutrition Board of the National Research Council.

COBALT Occurrence in Soils and Forages in Relation to a Nutritional Disorder in Ruminants—A Review of the Literature—Kenneth C. Beeson—*Gov't Printing Office*, U. S. Dept. of Ag. Inf. Bull. No. 7, 44 p., illus., paper, 15 cents.

DEVELOPMENTS CONCERNING THE PROPERTIES OF CASE STELS—Charles W. Briggs—*Steel Founders' Society of America*, 19 p., illus., paper, 20 cents.

EXTERNAL MORPHOLOGY OF THE PRIMATE BRAIN—Cornelius J. Connolly—*Thomas*, 378 p., illus., \$10.00. A monograph of important cortical developments from lemur to man.

THE GENEALOGY OF GYNAECOLOGY History of the Development of Gynaecology Throughout the Ages 2000 B.C.—1800 A.D.—James V. Ricci—*Blakiston*, 2nd ed., 494 p., \$8.50. A brief history of the contributions to gynecology by the various civilizations such as the Egyptian, the Hindu and Arabian.

GENERAL CLINICAL COUNSELING In Educational Institutions—Milton E. Hahn and Malcolm S. MacLean—*McGraw-Hill*, 375 p., \$3.50. A text for upper division and graduate students stressing basic theories and concepts.

A GEOGRAPHY OF EUROPE—Jean Gottman—*Holt*, 688 p., illus., \$5.00. Introductory European geography text emphasizing the cultural, economic and social factors as well as the physical elements of the countries.

HANDBOOK OF PHYSICAL MEDICINE AND REHABILITATION—Council on Physical Medicine and Rehabilitation of the American Medical Association, Compiler—*for American Medical Association* by *Blakiston*, 573 p., illus., \$4.25. A handbook describing the diagnoses and treatments of disease by various methods of physical medicine.

HEALTHY BABIES ARE HAPPY BABIES—Josephine Hemenway Kenyon and Ruth Kenyon Russell—*New American Library*, 237 p., illus., paper, 25 cents. A handbook on the physical care and psychological development of young children.

HIGHWAYS IN OUR NATIONAL LIFE A Symposium—Jean Labatut and Wheaton J. Lane, Eds.—*Princeton University Press*, 506 p., illus., \$7.50. Symposium of 45 essays on such subjects as history, sociology, economics, legislation, design, engineering and operation.

HOW TO PLAN, BUILD AND PAY FOR YOUR OWN HOME A Primer for Home Builders—Carl Zeigler and others—*Popular Mechanics Press*, 171 p., illus., paper, 60 cents (75 cents in Canada).

THE JAMES RIVER BASIN PASS, PRESENT AND FUTURE—The James River Project Committee—*Virginia Academy of Science*, 843 p., illus., \$6.00. Detailed account of this area, with particular attention to the development of biological, earth and applied sciences.

MEASUREMENT AND PREDICTION, Vol. IV—Samuel A. Stouffer and others—*Princeton University Press*, 756 p., illus., \$10.00. Sponsored by the research branch of the army and editorially sponsored by the Social Science Research Council, this is the last of the Studies in Social Psychology in World War II series. This study presents the theoretical and empirical analysis of the problems of measurement.

NEW FACTS ON BUSINESS CYCLES—Arthur F. Burns—*National Bureau of Economic Research*, 83 p., illus., paper, free upon request to publisher, 1819 Broadway, New York 23, N.Y. The Bureau's 30th annual report.

PEPTIC ULCER—A. C. Ivy, M. I. Grossman and William H. Bachrach—*Blakiston*, 1144 p., illus., \$14.00. A monograph on the diagnosis and treatment of peptic ulcer based on experimental and clinical data.

PRACTICAL INVERTEBRATE ANATOMY—W. S. Bullough—*Muswell*, 463 p., illus., \$4.50. Brief descriptions of the structure of more than a hundred invertebrate animals commonly examined or dissected by advanced students of zoology.

THE PREMATURE BABY—V. Mary Crosse—*Blakiston*, 2nd ed., 167 p., illus., \$2.75. Discusses problems arising in the care of the infant during and after premature labor.

PRESENTING TECHNICAL PAPERS Procedures Required by Technical Societies and Technical Sections of Trade Associations—Industrial Publicity Association—Harry W. Smith, 42 p., paper, \$2.50. How 17 technical societies handle the papers before their meetings, who handles publicity, what restrictions there are on publications and other useful details are included in this survey made by a small but active New York group.

PROBLEMS OF COLLEGIATE SUCCESS OR FAILURE WITH PARTICULAR REFERENCE TO PROFESSIONAL SCHOOLS OF MEDICINE—Archer W. Huid—*Medical College of Virginia*, 124 p., illus., paper, \$2.00. The results of studies made to determine why students fail.

THE STEEL CASTINGS INDUSTRY—*Steel Founders' Society of America*, 34 p., illus., paper, 25 cents.

UXACTUN, GUATEMALA: EXCAVATIONS OF 1931-1937—A. Ledyard Smith—*Carnegie Institution of Washington*, Publ. 588, 108 p., illus., paper, \$9.00 (Cloth. \$9.75). A monograph discussing the results of these excavations. Many valuable illustrations.

Science News Letter, July 1, 1950

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POCKET MICROSCOPE, fountainpen size, is particularly suitable for students doing field studies during the summer months. Supplied in 20 power and 40 power, it has four lenses in an aluminum tube and in use its lower end rests against the object being examined.

Science News Letter, July 1, 1950

WOOD STUDY kit, packed in a small box, contains 54 specimens of American wood and wood products, a knife, 10-power hand lens and an illustrated manual. It is designed to make wood identification and general knowledge of wood easy, instructive and entertaining.

Science News Letter, July 1, 1950

BACK-UP LIGHTS for the automobile, an aid to turning around in the dark where backing is involved, come in a kit with everything needed for home installation, including two lamps, clamps, wiring and an automatic switch. Lights turn on automatically when the car is put in reverse gear.

Science News Letter, July 1, 1950

VINYLLITE CURTAINS for the windows are made with lacy patterns, as shown in the picture, are delicate in appearance, strong and long-lasting. These plastic cur-



tains require no laundering, stretching or ironing because they can be wiped clean with a damp cloth.

Science News Letter, July 1, 1950

PICNIC COOKER, suitable also for "bachelor" use, consists of two aluminum pans that fit tightly together, one as a cover,

with heat being supplied from a solid fuel that comes with the stove. Replacement fuel is available. Cooker will fit in a car's love compartment.

Science News Letter, July 1, 1950

DEHYDRATED SOUP, prepared from peas for Army use, requires no cooking but is made ready to eat merely by pouring it into hot water, therefore can be easily prepared by individual soldiers separated from their commands. Its flavor, consistency and texture are satisfactory.

Science News Letter, July 1, 1950

TABLE TOP, made of a rock-hard substance fused into steel, is not damaged by hot pans, skillets, electric irons or even burning cigarettes. It can be scoured with kitchen powders and abrasives and absorbs no water. Edges are sealed against moisture with stainless steel trim.

Science News Letter, July 1, 1950

UTILITY TRAY that may be used on the dashboard of an automobile to hold cigarettes, coins and lipsticks, is held in place by a permanent magnet built into it. No screws, bolts or suction cups are needed, the magnet holds it firmly on any steel surface.

Science News Letter, July 1, 1950

Do You Know?

Spain produces about half the world's olive oil.

Snappers are the largest fresh-water turtles in the United States.

A machine used by chemists to determine the freshness of bread does so by squeezing it.

The temperature of the core of the sun is said to be around 20,000,000 degrees Fahrenheit.

Soybeans are not sown too early in the spring because the plants are sensitive to low temperatures.

There are said to be some 6,000 different kinds of insect pests which take a tremendous annual toll from the food supply of the world.

Sea levels along an extended coast may vary at different points because of winds, atmospheric pressures, saltiness of the water, oceanic currents and other factors.

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THE WEEKLY SUMMARY OF CURRENT SCIENCE



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VOL. 58 NO. 2 PAGES 17-32

MEDICINE

From Now On: Chronic Ills

Obesity control will help to prevent many common chronic ailments. Screening tests will help detect the causes of future disease.

By WATSON DAVIS

Fifteenth in a series of glances forward in science.

➤ IN olden days there were so many catching diseases causing premature death that many people did not live long enough to have the chronic diseases.

But the chronic diseases have been with us a long time. The golden harvest of the patent medicine man of former years was reaped largely from those who suffered from the pains of "rhumatiz" and other forms of chronic bad health. Some of these ills are virtually wiped out by today's successful treatments for the infectious diseases and their after-effects. Others are still with us.

The complex of ills that may properly be labeled "chronic" make a gigantic drain on the nation. Dr. A. L. Chapman, chief of the U. S. Public Health Service's division on chronic disease, figures that this combination of diseases.

Causes a million deaths a year.

Fills five out of six of our hospital beds.

Steals a billion man-days of work each year.

Not all of the so-called chronic diseases are uncontrollable. Many of them, such as

malaria, pellagra, pernicious anemia, hay fever and asthma, the venereal diseases, epilepsy and diabetes, can be dealt with successfully by known methods.

One thing to do in handling the situation is to start early with the people while they are young, both to prevent later illness and to prepare for the inevitable difficulties of old age.

The medical profession and the public health experts have been so busy with the acutely ill in past years that they have had little time to work out the newer methods needed for the chronic ills.

Some of the practical experiments under way include:

A. Obesity control, because getting the excess fat off of people helps prevent hypertension, diabetes, heart disease and even cancer and arthritis. The aim is not to reduce weight alone but give motivation to maintain the weight loss.

B. Attempting to discover hidden causes of future disease by screening tests, not for just one disease, but for all that can be picked up early. Tests of this are being made in Indianapolis and Boston.

C. Communities are attempting to reduce the cost of chronic diseases by better methods of home care and rehabilitation.

Science News Letter, July 8, 1950

origin in the ventricle of the heart. Though annoying, these extra heartbeats are not dangerous, but they often cause anxiety in those who have them.

Science News Letter, July 8, 1950

MEDICINE

Film Teaches Women to Examine Selves for Cancer

➤ A NEW and very personal way in which American women can actively fight cancer has been devised. It consists of a motion picture film designed to teach them how to examine their own breasts each month for early signs of cancer.

"Within the next few years, breast cancer may be reduced as a national problem," is the hope for the film expressed by Dr. Austin V. Derbert, chief of the U. S. National Cancer Institute cancer control branch.

The National Cancer Institute and the American Cancer Society are co-producers of the film. It was shown for the first time to physicians and newspaper writers at the meeting in San Francisco of the American Medical Association. Plans are to distribute it throughout the country for showing to women's organizations.

Of the 50,000 women who develop breast cancer each year, more than half are doomed to die within five years of diagnosis because the disease is not recognized until it reaches an advanced stage, Dr. Charles S. Cameron, medical and scientific director of the American Cancer Society, states.

Between 80% and 90% of these deaths could be prevented, he reports, if women themselves recognized the early stages of breast cancer.

Tumors as small as a half inch in diameter can be detected by the simple, four-step technique of breast examination taught in the film.

Science News Letter, July 8, 1950

MEDICINE

Pain-Killer for Heart

➤ THE local anesthetic which dentists use as a pain-killer has been converted by chemical modification into a powerful new drug for certain kinds of heart trouble.

Complete success with the drug in treating 13 of 15 patients and partial success in two was reported by Drs. Herbert J. Kayden, Lester C. Mark, J. Murray Steele and Bernard B. Brodie of New York University-Bellevue Medical Center at the meeting of the American Heart Association.

The new drug is called procaine amide. The parent drug is procaine, or novocain as it is also known. Procaine amide will be made immediately available on prescription under the trade name of Pronestyl.

The drug abolishes irregular rhythms of the heart known as ventricular tachycardias. Tachycardias are palpitations in layman's language. When they occur in the ventricles of the heart they are a most serious disturbance because of the ever present possibility of ventricular fibrillation developing. This last condition is one in which the fibers of

the heart muscle twitch separately and irregularly instead of all together. It may be fatal.

Procaine amide was made, along with a number of other related chemicals, after scientists had found that procaine injected into a vein abolished the extra heart beats which frequently occur during operations under anesthesia.

Procaine, however, is very quickly destroyed in the body and cannot be given by vein injection to conscious patients because it stimulates the central nervous system violently, even giving rise to convulsions.

Search for a drug without these disadvantages but with procaine's effect on the heart led to procaine amide.

The new drug acts quickly and can also be given by mouth. It is more powerful and less toxic than quinidine, drug now used for ventricular tachycardia.

Besides being effective in this condition, procaine amide will abolish the frequently annoying extra heart beats that have their

METEOROLOGY

East Cooler Than Normal, West Warmer in July

➤ THE weather will be good to the East during July—not so good to the area west of the Mississippi.

The Weather Bureau's 30-day outlook predicts that temperatures east of the Mississippi will be below normal, and quite a bit below normal in the center of that area. In addition, substantial showery rainfalls are predicted during the month for the same region, especially in the southeast and along the Atlantic seaboard.

The nation's dustbowl area is in for a month of subnormal rainfall. This is also true for the rest of the country west of the Mississippi. This will be accompanied by higher than normal temperatures, except for the Pacific coast where normal temperatures are expected.

Science News Letter, July 8, 1950

MEDICINE

Effects of Nerve Gases

Terrific eye pain, headache, inability to breathe and convulsions are symptoms of poison from military nerve gases. The poison remedy is atropine.

► THE most poisonous and most devastating war gases yet revealed—the nerve gases—were discussed in San Francisco in the first detailed report on these specialized poisons released by the Army.

Col. John R. Wood, since 1945 chief of the medical division of the Army Chemical Center at Edgewood, Md., told members of the American Medical Association how these nerve gases affect the body and what the remedy is.

Terrific eye pain, headache, inability to breathe and convulsions are among the symptoms preceding death from military nerve gas.

The poison remedy is atropine. Col. Wood did not give the names of any of the nerve gases in his report, though he indicated that they are similar to some of the newer insect killers, such as parathion and tetraethyl pyrophosphate, or TERP as it is called for short.

These nerve gases, he said, "are a family of chemicals having the common property of irreversibly inhibiting the enzyme, cholinesterase."

This blocks a vital body chemical reaction and allows excessive accumulation of another body chemical, acetylcholine, at the junction between the end of a nerve and the muscle it stimulates.

The nerve gases are almost colorless and odorless. They do not even cause any smarting of the skin or choking which would warn of their presence. They are more poisonous than formerly known war gases.

They can get into the body by inhalation of the vapor, or gas, or by absorption of the liquid form through the skin or eyes, or by being swallowed.

Atropine, the remedy reported by Col. Wood, was the German first aid treatment for nerve gas poisoning. This drug is the one eye specialists drop in eyes before examination for eye-glasses. It, or belladonna of which it is the active principle, is also used as an antispasmodic and many a patient with colitis has swallowed atropine drops in water for relief of his symptoms.

Very large doses of it must be used to counteract the nerve gases, Col. Wood said. But there is danger in using it in very severe cases with profound and prolonged oxygen lack due to the paralysis of breathing muscles. In these cases artificial respiration must be given first. The atropine, when used, is injected into the muscles or veins.

Treatment of nerve gas victims must be started very fast if they are to be saved. And the atropine doses must be repeated

every few hours for several days because the poisoning is much more persistent than the atropine effects.

When liquid nerve gas has been splashed on the skin, immediate swabbing with an alkaline fluid, such as ordinary household ammonia, is recommended. Clothing splashed with the liquid gas should be removed at once and left outdoors. Patients should not be admitted to hospitals or other enclosed spaces until all liquid nerve gas contamination of skin and clothing has been eliminated, Col. Wood warned. Otherwise the vapors will endanger other patients and hospital personnel.

The statement, often made, that these nerve gases will "destroy the enemy's will to fight" does not refer to any strange effect on the human body. The nerve gases can paralyze, convulse and kill. Used against an army or a population, they might convince an enemy that there was no use in continuing to fight, much as the atom bomb convinced the Japs that it was time to surrender.

The standard gas mask of our army will protect against nerve gases. And our army's protective clothing will protect against the liquid form.

The details about nerve gases were given

to the doctors meeting because it is felt that for civilian defense it is best to have such information given to the medical world. Knowledge of what to expect and how to handle it, military authorities believe, will reduce the casualties that come from fear and panic over a new weapon such as the nerve gases.

Further reassurance for civilian defense, not mentioned by Col. Wood in his report, comes from British sources which indicate that buildings with ventilating systems could readily be decontaminated by putting chlorine or ammonia into the air inlet tube.

Science News Letter, July 8, 1950

PSYCHOLOGY

Lie Detector Reveals Problem Children

► A LIE detector used in reverse is scrying to spot a "dead-pan" emotional abnormality of children associated with delinquency.

As ordinarily employed, the lie detector reveals emotional response of an individual under questioning by recording changes in the electric conductivity of the skin.

Used with a very sensitive photoelectric recorder, the lie detector can be used to spot those who have no emotional response at all to situations that commonly rouse anger, fear or other strong emotion. This "dead pan" reaction was found characteristic of problem children, 85% of whom had spent time in disciplinary and penal institutions.

This novel use of the recorder, a General Electric product, is reported by Bernard R. Higley, of the Alfred L. Willson Children's Center, Columbus, Ohio.

Science News Letter, July 8, 1950



DETECTOR FOR DELINQUENTS—The lie detector is being used with a sensitive recorder to spot problem children, many of whom are juvenile delinquents. The problem children tend to exhibit a "dead pan" lack of emotional reaction.

PHYSICS

Radioactive Greenhouse

See Front Cover

► THE new greenhouse looks like all the others at the Department of Agriculture's huge plant industry station at Beltsville, Md. But around it is a seven-foot-high chain link fence. Signs on the fence, bearing the three-segmented red symbol of the Atomic Energy Commission, read DANGER—Area Used For Radioactive Materials; Admission by Permit Only.

As equipment was being moved into the AEC-built, \$250,000 greenhouse last week, the Commission and Agriculture Department announced they are ready for "one of the important peacetime projects made possible by atomic energy."

Radioactive tracer materials hotter than any used so far in plant research will be the principal tools in the specially-equipped greenhouse, where government scientists will track down secrets of growth from the soil.

"None of the work will be secret," said Dr. F. W. Parker, assistant chief of the Bureau of Plant Industry. Admission to the area will be restricted only because of radiation hazards, he explained. Research workers will be trained in taking needed precautions.

To protect workers on the "Radioactive Isotope Project," the greenhouse has many special features. Stainless steel plates line the doors to the basement section where tracer materials, mainly from the atomic energy plant at Oak Ridge, Tenn., will be received.

The photograph on this week's cover of SCIENCE NEWS LETTER shows the 18-inch-thick concrete "well" in an underground room beyond the greenhouse proper where cans of the radioactive isotopes will be stored. Dr. L. T. Alexander who heads the

radioactive project is at the left in the picture, and Arnold MacKenzie, a project chemist, is at the right. All handling here will be by remote control. The floor, as in other rooms where contamination is likely, is of asphalt tile easily replaceable should radioactive materials be spilled on it.

There are special sinks in each section of the greenhouse, piped to carry contaminated wastes into a special receptacle. Exhaust systems from lead-lined hoods contain filters to catch radioactive particles in the air.

Previous uses of radioactive "tagged" elements have shown their value in plant science. The Department of Agriculture, together with AEC and many state agricultural experiment stations, have used tracer materials in studying plants and soils for more than three years.

The new greenhouse will permit new radioactive elements to be used, among them calcium, zinc and sulfur, Dr. Alexander said.

Both inside the greenhouse, where water flowing over the glass roof will aid in controlling temperature, and on the two-acre plot surrounding the new building, studies will be carried on to learn more of how plants draw nutrition from various types of soil.

By substituting for normal elements in the soil the same elements made radioactive, researchers will be able to trace with Geiger counters and other instruments of the atomic age the way in which crops absorb their food and flourish—or wilt and die—under various conditions of U. S. farming.

Science News Letter, July 8, 1950

RADIO

Saturday, July 15, 1950, 3-15 p.m., EDST

"Adventures in Science" with Watson Davis, Director of Science Service, over Columbia Broadcasting System.

Mr. Davis will discuss "Our Atomic Future"

Growth or loss of *han* depends upon heredity, the supply of sex hormones and on age.

SCIENCE NEWS LETTER

VOL. 58 JULY 8, 1950 No. 2

45,100 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W. Washington 6, D. C., North 2255 Edited by WATSON DAVIS

Subscription rates: 1 yr., \$5.50, 2 yrs., \$10.00, 3 yrs., \$14.50, single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925, 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STATE 4439.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

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Why is Mars red? p. 28.

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PHYSICS

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MEDICINE

Pituitary Gland in Cancer

When pure growth hormone is given to rats, they not only double their normal size, but they get cancers. The reason for this effect is not known.

➤ A NEW idea of how cancer starts is developing from studies reported by University of California medical researchers at the meeting of the American Medical Association in San Francisco.

The pituitary gland, tiny but powerful organ at the base of the brain, is involved. This gland is known to produce half a dozen or more hormone chemicals, among them ACTH, currently famous for the dramatic relief it has brought in arthritis and other conditions.

ACTH acts on the cortex, or outer part, of the adrenal gland. But it is the growth hormone of the pituitary gland that is arousing scientific interest in connection with cancer.

When this hormone in pure form is given to normal rats, the animals grow twice the normal size. But they also get cancer. Some of the animals got cancers in the lungs. Others got them in the ovaries. In one instance, four different tumors, or cancers, developed on one ovary. And some animals got a very rare form of adrenal gland cancer. Almost all of the rats got cancers of the breast tissues.

These results occurred when the animals were given the pure growth hormone over a long period, about half the animal's nor-

mal life span.

Just why the pituitary gland growth hormone has this effect is not known. Cancer, of course, is a form of abnormal growth, but pituitary growth hormone ordinarily is a stimulator of normal growth. When given to animals that have had their own pituitary glands removed, the pure growth

ANTHROPOLOGY

Hunger Regulates Lives

➤ WHEN a people live in a state of semi-starvation, hunger dominates their lives. Hunger becomes such a motivating factor that they will kill useless persons, regulate their love life by the state of their food supply and dream at night about food.

This was discovered in a year's study of a nomadic Indian tribe of Bolivia, so dominated by the need for food that other skills, the arts and religion had either been lost or were never learned.

The study was made by Dr. Allan R. Holmberg, anthropologist, and was issued by the Smithsonian Institution in Washington.

Dr. Holmberg found that this tribe—the

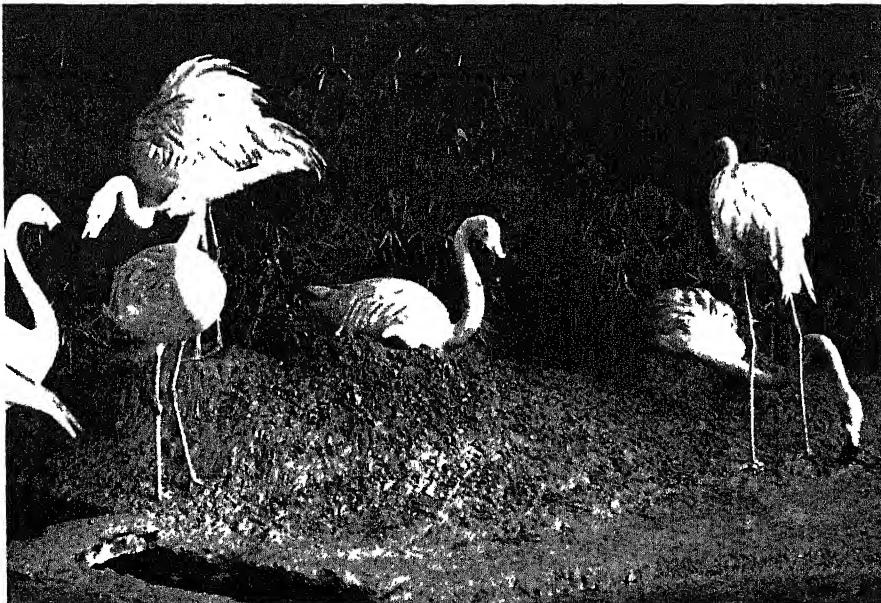
hormone stimulates growth without producing cancers.

Next experiment the California researchers want to try is injection of a known cancer-causing chemical, such as methylcholanthrene, in rats without pituitary glands, to see whether the cancers develop in the absence of growth hormone.

The experiments may shed some light on why sex hormones bring temporary relief in some forms of cancer, and they give some rational basis for the often-suggested idea of irradiating the pituitary gland in the hope of controlling cancer.

The studies reported at the meeting were by Drs. Henry D. Moon, Miriam E. Simpson, Choh Hao Li and Herbert M. Evans.

Science News Letter, July 8, 1950



FLAMINGO'S NEST—Despite their captivity in the San Antonio zoo, the two flamingos in the center do not allow that to interfere with their plans for a family, as they constantly continue to set on the one egg. This is one of the rare instances of flamingos nesting in actual captivity.

Siriono Indians—even wore no clothes, although a scorching sun and hordes of insects would seem to make clothing imperative.

The Siriono were selected for study because they are almost constantly hungry, depending almost entirely on wild game and fish, berries, nuts and other wild food from the forest to keep them from starvation. Following up studies made at Yale's Institute of Human Relations, Dr. Holmberg wanted to find out what effect the anxiety and frustration caused by continuous food shortage would have on the people suffering them.

Among a people who are always hungry, food becomes the greatest interest in life, Dr. Holmberg found. People do not marry for love among the Siriono. Wives and also "other women" outside the home are wooed by promises of food. Young girls fall for the man who is the best hunter. And wives quarrel with their husbands not because of infidelity but because he gives food to another woman.

Even sexual activity is governed by the food supply. When the food deprivation is relieved temporarily by an abundance of food, as when a hunter returns with a good bag of game, everybody eats to excess. The periods of deprivation, Dr. Holmberg observed, are accompanied by sexual abstinence, periods of gluttony are followed by sexual excesses.

The backwardness of the Siriono people is blamed, at least in part, by Dr. Holmberg on their preoccupation with the food problem. Technology is mostly absent, art non-existent, social and political organization relatively simple.

The hunter must walk as far as 20 miles in a day searching for game, but roads are unknown and trails not cleared. Although waterways are abundant, canoes or boats are unknown.

The Siriono is aggressive. He fights for his share of food. He eats principally alone

in the night or during the day may steal off in the forest to eat. He eats whenever he can, even if he is not hungry, and even when he sleeps, he dreams about food.

The old and very sick who might prove a burden on the food supply are often callously abandoned to die.

The single exception to the every-man-for-himself attitude of the Siriono is his

treatment of children. Children are loved to excess and overindulgently treated. When a mother feels that she must punish her child, she herself weeps. Babies are nursed until they are about three years old. And when a child is suffering from hunger, fatigue, or pain, he is shown more love than at other times.

Science News Letter, July 8, 1950

BIOLOGY

Germ Warfare in Korea?

➤ GERM warfare may get a trial very soon, if the fighting in Korea continues. The situation might be considered by the Soviets as a good one in which to stage a trial of such a weapon, if they have developed a satisfactory method of using it.

B W, short for biological, or germ warfare was mentioned in San Francisco, as a possibility "in the event of future wars" in a report by Dr. Joseph E. Smadel, of the Army Medical School, at the second military medical session at the American Medical Association meeting.

Dr. Smadel did not refer to the Korean situation in his formal paper. But he did say, discussing germ diseases of future wars, "that these include those human infections caused by microbial agents or their products which might be disseminated artificially by wilful intent." In other words, germs used as weapons.

"This last subject is certainly not one to be dismissed casually, neither is it one to strike hopeless terror into the minds of civilian and military personnel," he stated.

"The risks associated with the limited geographic use of such methods are no more hazardous to persons directly exposed than are the effects of high explosives or nuclear weapons.

"There is no reason to believe that a large scale man-made episode, provided it could be accomplished, would spread and become an epidemic among the unexposed," he added reassuringly.

"Small scale episodes, which are undoubtedly possible, could be delimited and controlled by the present methods available to the public health and civilian and military medical personnel."

Even without germ warfare, there are a number of diseases that may for the first time become military problems. Infantile paralysis is one of these which Dr. Smadel mentioned. Polio "does not at present constitute a military problem but the recent outbreaks of this disease among the Eskimo populations point to a need for considering this malady in troops operating in the Arctic where ordinary sanitation is essentially impossible to maintain," he stated.

One of the numerous viruses, discovered in Africa and South America in recent years by members of the Rockefeller Foundation during their studies on yellow fever might

be the cause of a "new" disease of military significance, he continued.

Among the old diseases which plagued armies in World War II, the following may be expected to appear again in future wars: diarrhea, dysentery, influenza and pneumonia, and, even though they were relatively well controlled, typhus, typhoid and paratyphoid fevers, plague, cholera, smallpox, epidemic meningitis, scarlet fever and streptococcus throat infections and wound infections.

Any American fighting men wounded in Korea are being evacuated by air, if armed forces plans revealed to the American Medical Association are being followed.

Hospital trains and hospital ships are out, in military medical planning. As long ago as last August (1949), air evacuation was adopted as "the sole method of patient movement for the armed forces, replacing hospital ships and hospital trains," Lieut. Col. B. A. Strickland, director of the military medicine division of the Air Force School of Aviation Medicine, announced.

Over 1,423,263 patients were evacuated by air between 1942 and 1949, he reported. Since 1945 only one death has occurred in air evacuation.

Science News Letter, July 8, 1950

MEDICINE

Device Helps Prevent Baby Suffocation Danger

➤ NEWBORN babies in danger of suffocating can be saved by a new mechanical device which starts them breathing normally.

The device, called an air lock, was shown to physicians at the meeting in San Francisco of the American Medical Association. It has already lowered the baby death rate at St. Joseph's Maternity Hospital, Houston, Tex., by one-fourth, Dr. Allan Bloxson reports. Dr. Bloxson is on the staff of the hospital and of Baylor University College of Medicine at Houston.

The newborn baby in danger of asphyxiation is put into a tube-like tank immediately after birth, instead of being slapped, held hanging by its heels or having a suction tube put into its windpipe. Pressures within the lock are automatically regulated to simulate as far as possible those during

the second stage of labor. In normal babies and normal childbirths, the pressures during labor initiate the baby into breathing.

Heat and humidity are regulated and increased oxygen concentrations are furnished. Since the air lock is of glass, baby's behavior while in it can be watched. After baby is in the apparatus, pressure in the air lock is raised to three pounds per square inch by tightly closing the lock. When this level is reached, the lock automatically opens and the pressure is lowered to one pound. Then a switch closes the lock again. This automatic cycling is repeated every 45 seconds. The air lock has been used in 100 cases out of 1,786 deliveries at St. Joseph's Hospital. The death rate in the first four months of this year, other than stillbirths, was 1.9% compared to a mortality rate of 2.5% in the same period of 1949, before the lock was used.

Science News Letter, July 8, 1950

GEOLOGY

New England May Have Been Sub-Tropical

➤ SCIENTISTS studying a long-abandoned, almost forgotten coal mine in Brandon, Vt., have come face to face with an intriguing question: Was northern New England once sub-tropical?

Fossilized plants and woody tissue preserved in the soft coal are of types found today only in southern U. S. latitudes, Dr. Elso S. Barghoorn of Harvard and Dr. William Spackman of Penn State report in the JOURNAL OF THE SOCIETY OF ECONOMIC GEOLOGISTS.

The Brandon deposit of lignite, a fuel that lies between peat and soft "brown coal" in its geologic development, has long been recognized as a geologic black sheep. It isn't where it ought to be. Discovered 102 years ago and actively mined only for a few decades, the pocket of soft, sooty fuel is "as out of place in Vermont as pignies and palm trees," said Dr. H. A. Meyerhoff of the American Association for the Advancement of Science, who has also studied the geology of the Brandon area.

How the lignite was formed, why it was deposited in Brandon when very few other instances of Tertiary age low grade coal exist in the northeastern United States, are mysteries "for which there is at present no easy resolution," Drs. Barghoorn and Spackman say.

Plants in the Brandon lignite are unusually well preserved. Most of them can be identified with certainty. Of 13 known types, nine grow today only in swamps of the Atlantic and Gulf coastal plain from the Carolinas southward.

"It is evident . . . that the climate which prevailed during the accumulation of the Brandon sediments was very different from that which now prevails in these latitudes," the scientists say.

Science News Letter, July 8, 1950

MEDICINE

If Atomic War Comes . . .

Food and water will probably be safe in the event of resort to atomic weapons. Gelatin and dextran may be used as plasma substitutes.

➤ IN the generally grim picture of atomic war medical problems being drawn at the American Medical Association meeting in San Francisco, one note of reassurance was sounded

Large scale contamination of the water supply of a major city is unlikely, and food supplies will be only partially affected by an atomic bombing. This was reported by Brig. Gen. James P. Cooney, chief of the radiological branch of the Atomic Energy Commission's Military Application Division.

"The amount of radioactive material required to contaminate the water supply of a large city is so great that this hazard seems unlikely," he stated

Packaged or canned foods will be safe, and unprotected foods may be safe though they would need checking with radiation detection devices before use. A contaminated carcass of beef, for example, could be used by removing the outer, contaminated layers. This, Gen. Cooney explained, is because fission products from atomic bombs stick fast to anything they come in contact with but do not penetrate deeply.

Experience from the planned study and care of a fairly large number of ordinary burn patients will prove helpful for handling atomic burn patients, in the opinion of Dr. Everett Idris Evans, professor of surgery at the Medical College of Virginia.

Dr. Evans does not minimize the vast size and complexity of the problem of caring for burn patients after an atomic attack. But he does not think the type of injury would be different from ordinary burns.

Most peacetime burns, Dr. Evans pointed out, result from exposure to low temperatures over a relatively long period. Burns from hot water or steam are inflicted at temperatures ranging from 60 to 120 degrees Centigrade over periods of approximately a minute down to only a few seconds.

With a "flash burn" such as comes in atomic warfare, presumably there is higher temperature over a shorter period. One scientist, Dr. Herman E. Pearce of the University of Rochester, N. Y., has studied pigs burned by explosion of magnesium and found that these burns looked and healed somewhat differently from ordinary burns.

Two human patients burned by the accidental explosion at close range of quantities of magnesium gave Dr. Evans and associates a recent opportunity to study this kind of burn. The hands and forearms were involved. Shortly after the explosion,

blisters formed on the burned fingers and palms. Closed pressure dressing methods of treatment were used for these patients. The course of recovery and healing of these two patients "was in every way similar to that noted in ordinary burns."

Prevention and treatment of burn shock, emergency dressing of the burn wound and provision of proper amounts of fluid and electrolytes such as salt are still the three important aspects of emergency management of severe burns, Dr. Evans stated.

Gelatin and dextran may have to be used as plasma substitutes in case of mass burn casualties, because there probably won't be enough blood and plasma, Dr. Evans said. Gelatin is "a safe and effective" plasma substitute but presently available solutions of it are not suitable for mass casualty use because of their high viscosity, he said.

He considers dextran effective for burn shock, but is not satisfied that there have been enough studies of possible kidney and liver damage to prove its complete safety. Dextran is a gummy substance produced from milk, beet juice and molasses by bacterial action. It has been used in Sweden as a blood and plasma substitute.

A single, one-piece large burn dressing for extensive burns that can be applied by trained lay persons in about one-sixth to one-tenth the time required for the ordinary pressure dressing has been developed, and will probably be the answer to the burn dressing problem. A simple, glove-like dressing for hand burns is now being worked on. This will be needed because flash burns chiefly affect the hands and face. Most face burns heal best without dressings, Dr. Evans said.

Adequate trial of penicillin or other antibiotics in a salve to be applied to the burns should be made, Dr. Evans declared. If such a salve proved effective, it would save a tremendous amount of time, personnel and equipment in treatment of mass burn casualties.

Blood transfusions, the blue dye called toluidine blue, aureomycin and other antibiotics, oxygen and vein feedings of plasma, sugar, minerals and vitamins are measures that may be useful in treating the radiation damage of atom bombs, Dr. J. Garrett Allen of the University of Chicago reported.

The frequent transfusions of blood and doses of toluidine blue would be helpful but not completely successful in controlling the hemorrhage from atomic bomb or other radiation damage, he said.

Aureomycin is "distinctly beneficial to per-

sons receiving borderline lethal exposures" of radiation because of its effect in fighting infection.

The oxygen treatment would be for the anemia and the vein feeding to overcome malnutrition due to appetite loss, vomiting and diarrhea of late stages of irradiation sickness.

Science News Letter, July 8, 1950

ENGINEERING

Ion Gauge Measures Low Air Pressure

➤ AN electronic pressure-gauge, for use in measuring the tiny air pressure remaining in a near-vacuum chamber, is claimed to be 200 times more sensitive than any other ever produced.

The gauge was revealed in Pittsburgh by Dr. Daniel Alpert under whose supervision it was developed by Robert T. Bayard, both of Westinghouse Electric Corporation. It is called an "ion gauge" and is able to detect the presence of air in a vacuum where only one air molecule remains out of every 10,000 billion originally present.

To measure the pressure in a vacuum, the gauge is sealed to the system. When electric power is turned on, electrons are released from the gauge. When these collide with air molecules in their path, they knock off positively charged particles called ions. The number of ions formed in this way is an accurate measure of the pressure inside the vacuum system.

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PLENTY OF NOTHING—The electronic gauges which are adept at measuring almost nothing, developed by Robert T. Bayard, can detect air in a vacuum where only one air molecule remains out of every 10,000 billion originally present. This device will aid in exploring regions of ultra-low pressures.

DENTISTRY

Do Not Drink Too Much Citrus Fruit Juice

➤ A WARNING against drinking too much citrus fruit juice with detrimental effects to the teeth and gums was sounded in Greenwich, Conn., by Dr. Henry Hicks.

Citrus fruits are high in vitamin C required for building connective tissue and bones. Moderate amounts of orange, lemon or grapefruit juice are not condemned by Dr. Hicks.

He states, however, that "it would seem that more than two or three oranges or one grapefruit per week is excessive, in view of the fact that vitamin C is obtainable from other sources."

He bases his warning on more than 50 cases of detrimental effects to the oral cavity, or mouth, noted during the last 15 years. These effects included hypersensitive teeth, bleeding gums and loose teeth. When citrus fruits were removed from the patients' diets, the mouth and gums returned to normal, Dr. Hicks states in his report to the JOURNAL OF THE AMERICAN DENTAL ASSOCIATION (July).

Dr. Hicks recommends that the current popular belief that drinking large quantities of citrus fruit juices is healthful should be carefully appraised.

Science News Letter, July 8, 1950

MEDICINE

Nerve Chemical Found In Nerveless Placenta

➤ A CHEMICAL usually associated with nervous activity exists in the nerve-free human placenta, which is the organ in the uterus that establishes communication between the mother and unborn child.

The chemical is "true" cholinesterase. There is also a "pseudo-cholinesterase." Existence in the placenta of the true cholinesterase was discovered by Drs. M. G. Old and R. H. S. Thompson of Guy's Hospital Medical School in London.

Red blood cells, they point out, are the only other nerve-free tissue so far known to contain almost exclusively true cholinesterase.

Details of their findings are reported in the scientific journal, NATURE (June 10).

Science News Letter, July 8, 1950

Chemical Prevents Poultry Blackhead Disease

➤ AN economical method of preventing the costly blackhead disease (enterohepatitis) of turkeys and chickens has been found in a new chemical synthesized in Stamford, Conn., at the American Cyanamid Co. laboratories.

Treatment for two weeks with small amounts of the new drug, trademarked Enheptin-T, chemically 2-amino-5-nitrothiazole, kept the poultry alive and flourishing even when purposely infected with the disease.

The drug could be used as a routine, long-term, continuous treatment, it was indicated by Drs. E. Waletzky, J. H. Clark and H. W. Marson in a report to the journal SCIENCE (June 30).

Science News Letter, July 8, 1950

PSYCHIATRY

Ice Pick Operation Helps Patients On "Back" Wards

➤ A BRAIN operation so simple that 15 can be done in one and one-half hours may help to clear the "back" wards of our mental hospitals, restoring the tragic patients partially if not fully to normal life.

The operation is the "ice pick" one devised two years ago by Dr. Walter Freeman of Washington, D. C. Medically it is known as transorbital leukotomy. A sharp, slender instrument like an ice pick is driven through the bony part of the eye socket into the front of the brain. The instrument is then swung through an arc of 30 degrees and withdrawn. The operation is believed to achieve its results by cutting connections between certain parts of the brain.

The value of the operation in relieving overcrowding in state mental hospitals was stressed by Dr. Matthew T. Moore of the University of Pennsylvania Graduate School of Medicine and Drs. Ralph L. Hill and Wilbur M. Lutz of the Wernersville, Pa., State Hospital at the meeting of the American Medical Association in San Francisco.

Improvement in 77 out of 102 patients at this hospital followed the operation, they reported. Twenty-five patients were able to go home.

Even a little improvement in schizophrenia patients, they pointed out, constitutes a major advantage in a state hospital in that such patients who have been nursing problems show improvement in behavior.

A large part of the patients were from the "back" wards and had been considered permanently nonsalvageable custodial cases. Patients ill more than 10 years showed improvement.

There were two deaths, a mortality rate lower than that experienced in other types of operations in mental cases.

Patients were able to be out of bed within 24 to 48 hours and needed no nursing care after the immediate post-operative period.

As a result of their experience, the Pennsylvania doctors recommend that patients admitted to state hospitals should be offered the advantages of this operation when other forms of treatment have repeatedly failed.

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CHEMISTRY

Antibiotics in Cattle Stop Germs—and Cheese

➤ COWS treated with penicillin or streptomycin may stay healthy, but the milk they give will not make good cheese, dairy scientists have discovered.

Researchers from the Department of Agriculture and the Florida Agricultural Experiment Station reported separately last week that antibiotics seem to inhibit the starter mechanisms in milk which begin the transformation into cheese.

The discovery may be of future significance to the dairy industry, they told the annual meeting of the American Dairy Science Association, at Ithaca, N. Y.

Science News Letter, July 8, 1950

MEDICINE

Gastrin May Partially Cause Stomach Ulcers

➤ DISCOVERY of a stomach hormone, called gastrin, which could play a part in causing ulcers, was announced by Dr. Lester R. Dragstedt and associates of the University of Chicago at the meeting of the American Medical Association.

The hormone is produced by the lower part of the stomach, or antrum. It is only produced when the antrum is in contact with food. Its possible role in ulcer production was found in studies on dogs. Transplanting the antrum from the stomach to the intestines in these animals caused over-secretion of stomach juice in the rest of the stomach and formation of peptic ulcers.

The antrum-gastrin action is responsible for about 40% to 45% of stomach juice secretion and another 40% is due to nervous stimulation. In duodenal ulcer patients this nervous stimulation is markedly exaggerated and accounts for up to 80% of the total secretion.

Cutting the vagus nerves to the stomach brings immediate relief to ulcer patients and keeps them well. Of 509 patients who had this operation during the period 1943 to 1950, 408 or 80% are entirely well at the present time. They are back at their usual occupations without having to follow any diet or take any medicine.

Another 54 are apparently free of active ulcer disease but complain of some symptoms, so they cannot be considered entirely cured. Another 47 of the patients are considered failures.

Dr. Dragstedt's exhibit of the hormone discovery studies won the AMA Gold Medal for presentation of original work.

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THE FIELDS

MEDICINE

Brain Waves of Patient Control Anesthetic

➤ A NEW kind of electronic brain made its debut at the American Medical Association in San Francisco. This brain is for putting patients to sleep during operations.

It is operated by the patient's own brain waves, so that the patient is giving himself his own anesthetic and controlling the amount of it while he sleeps and the surgeon operates. The brain was devised by Dr. Reginald G. Bickford of the Mayo Clinic and has already been used successfully on more than 50 patients during operations.

Last year at the American Medical Association meeting, Dr. Bickford showed that brain wave records could be used by the anesthetist to gauge the degree of unconsciousness. With this as a guide, the amount of anesthetic could be increased or decreased as needed.

The new device goes a step farther and harnesses the brain waves themselves to regulate the amount of anesthetic being pumped into the patient's veins or into an ether vaporizer and mask. The brain waves are the fluctuations in electrical potential accompanying brain activity. As anesthesia deepens, this activity and the energy output of the brain waves grow less and less.

The machine does not do away with the anesthetist, but relieves him of much tedious work. It was called a milestone in the field of anesthesia by Dr. Charles W. Mayo of the Clinic's surgical division.

"It is the first time," he said, "that a purely automatic method of administering anesthesia has ever been attempted."

It may have value, he pointed out, in certain mental conditions or physical states in which a constant degree of controlled rest and relaxation may be desired.

Science News Letter, July 8, 1950

MEDICINE

Streptomycin Cuts Death Rate from Radiation

➤ RATS given a lethal dose of atomic radiation have been saved from death by the new wonder drugs, the antibiotics, in University of Chicago laboratories.

Streptomycin cut the death rate from radiation injury from 81% to 16% in one group of rats. It showed better protection against the internal infection which follows radiation than any other antibiotic tested, a research team headed by Dr. C.

Phillip Miller reported in the journal *Science* (June 30).

Results with aureomycin, golden-yellow mold-grown drug, were irregular. One experiment showed a significant reduction in the death rate. Another experiment showed none. A combination of penicillin and streptomycin, as well as the lesser known antibiotic chloramphenicol, were less effective than streptomycin alone.

The experiments supported the belief that much of the danger of atomic bomb attack lies in blood infection following intense radiation.

Dr. Miller and his associates, Carolyn W. Hammond and Marianne Tompkins, say that germ-killing drugs, to be effective, must be active against a wide variety of bacteria.

Science News Letter, July 8, 1950

AGRICULTURE

Weed-Killer Prevents Off-Flavor Milk

➤ WILD onions, weeds that make cows turn out milk with an off-flavor, may soon be tamed with a new weed-killer called maleic hydrazide.

Tests begun last November by a Department of Agriculture scientist, Vernon C. Harris, in cooperation with the Mississippi Agricultural Experiment Station, have begun to pay off. While the onions only turned yellow after the treatment, by May of this year they had died.

Work is still needed to learn how much of the chemical can safely be used on a pasture. It is not believed the substance would be toxic to cows grazing on sprayed areas.

Science News Letter, July 8, 1950

MEDICINE

Inaudible Vibrations of Heart Are Dominant

➤ HEART vibrations of low-frequency that cannot be heard by the human ear are the dominant vibrations produced by the heart's mechanical activity, Dr. Franklin D. Johnston of the University of Michigan reported at the meeting of the American Heart Association in San Francisco.

He has worked out a method of recording both these inaudible heart vibrations and the audible ones simultaneously with a record of the heart's electrical activity, or an electro-cardiogram. The method involves the use of equipment for separate registration of curves which represent the velocity and amount of in-and-out movement of the chest wall as a result of the heart's mechanical activity.

This is the first time, he said, that both types of records have been studied and distinguished clearly one from the other. The new method is expected to give valuable aid in diagnosing heart conditions.

Science News Letter, July 8, 1950

MEDICINE

Bacitracin Fights Amebic Dysentery

➤ BACITRACIN, the antibiotic drug first obtained from germs in the leg wound of a girl injured in an accident, is proving an effective weapon against amebic dysentery.

The antibiotic stops acute attacks of amebic colitis, and routs the ameba from the intestines. Ulcers heal and patients recover completely. These good results in eight severe cases are reported by Drs. Harry Most, J. W. Miller, E. B. Grossman and Neal Conan, Jr., of New York in the *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* (July 1).

Relapse occurred in one patient within nine months, and another three had reappearance of amebas but no symptoms. In one severe case bacitracin cured the patient after other anti-amebic drugs and antibiotics, including aureomycin, had failed.

Of 43 mildly sick patients or patients with amebic infection but no symptoms, 80% were apparently cured by one or more courses of bacitracin treatment. The probability of cure from a single course of treatment is 66%. The drug was given by mouth. Toxic symptoms were negligible.

Science News Letter, July 8, 1950

METEOROLOGY

30-Day Weather Forecasts 79% Accurate

➤ THE United States can now know what its weather will be 30 days in advance with an accuracy of 79%. This is the record of the extended forecasts of the U. S. Weather Bureau during the first three months since they were first made public.

From Feb. 17 on, the Extended Forecast Section of the Weather Bureau has made seven twice-monthly 30-day predictions which can now be checked with the weather as it actually was. In those seven forecasts, 31 predictions were made about the temperatures and the rain or snow in various parts of the country. Of these, 23 were correct, three were half right and half wrong, and five were incorrect.

Science News Letter, July 8, 1950

GENERAL SCIENCE

Cortisone Discoverers Get Passano Award

➤ DISCOVERY of cortisone and its application to the relief of rheumatic diseases brought the \$5000 Passano Foundation award this year to Drs. Philip S. Hench and Edward C. Kendall of the Mayo Clinic. The award was presented at the meeting of the American Medical Association in San Francisco.

Science News Letter, July 8, 1950

ENTOMOLOGY

Insects on the March

Damage from bugs increases while man fights back. Their diet ranging from cotton to fruit, these insects eat more than 10% of each year's food crop.

By SAM MATTHEWS

► INSECTS this year will do more than four billion dollars damage in the United States.

They will take one bite of our food, the first bite, for every nine that humans take. They will ruin whole forests and fields.

Farmers and scientists will fight back with planes, poison gas, fire and deadly fogs. But odds are on the bugs this year. Government experts expect serious trouble. They say millions of eggs normally killed by cold have survived the mild winter.

On the Western plains, grasshoppers. In the corn belt, the dread European borers. In the South, boll weevils. Other insect pests are gorging themselves in the fruit orchards of the Pacific Northwest, gnawing through Virginia tobacco, tunneling with gusto into New England potatoes and apples.

In the past ten years, the U. S. Department of Agriculture estimates, annual national loss to insects has risen from \$3,000,000,000 to \$4,000,000,000.

This was despite development of such potent new insecticides as DDT, benzene hexachloride (known to farmers as "666") and methoxychlor, a super-DDT which is non-poisonous to men or animals. Foreign parasites have been imported to feed on insect pests. Bacteriological warfare—fighting insects with disease germs—is being tried by University of California scientists. Rigid quarantines, fumigation, poisoned bait, burning wheat fields, plowing under larvae-riddled cornstalks—all these are among man's weapons.

A Bad Year in 1950

Yet the Agriculture Department has issued a warning to farmers early in the spring: brace yourselves, this will be a bad year.

Huge numbers of grasshopper eggs were found in surveys last fall. Chief threat appears to be in Montana, North Dakota and Wyoming. But epidemic swarms may appear from Texas to Canada and west to California.

Losses to grasshoppers on farmland and ranges were the highest last year since 1939. Conservative estimate for crops alone was \$27,500,000, Agriculture said. It would have been many times that figure but for an all-out sowing of poisoned bait from low-flying planes. The program saved about \$55 for each dollar spent, the Bureau of

Entomology reports. Chemicals known as chlordane and toxaphene were new weapons.

European corn borers spread into 145 more counties in the United States in 1949. Now infested by this flesh-colored worm: 1312 counties in 29 states. Moving slowly westward, the corn borer destroyed nearly \$350,000,000 in crops last year—four times the number of bushels of corn ruined the year before.

"The pest will do even more damage in 1950 if weather is favorable," the Agriculture Department warns.

Farmers have been battling the corn borer since it arrived in this country in 1917. They plow under corn stalks, burn them, spray them with DDT and even the deadly poison parathion. Still the borers' numbers increase.

Boll Weevil in Full Force

Third pest expected to attack in record strength is the cotton-destroying boll weevil. After a "successful winter," record numbers of the dread weevils were hatching this month—they may top the 1949 plague figure of \$470,000,000.

Wheat ranchers search for telltale signs of the greenbug. In the early 1940's they licked an invasion of the wheat-eating Hessian fly by burning grain fields. They do not like the memory. But the greenbug aphid has already caused serious losses in the winter wheat crop. It may run rampant as far north as the Dakotas later in the summer.

These are the crop pests which the Department of Agriculture deems most dangerous for 1950. There are about 600 major pest species on its lists. Dr. Charles T. Brues, Harvard entomologist, estimates that nearly half of the 800,000 known insect species in the United States feed directly on plant tissues.

"More than 10% of each year's food crop goes to insects," he says.

The pink bollworm feeds on cotton, the green peach aphid on tobacco. The golden nematode likes Long Island potatoes. There are the pear psylla, sweet potato weevil, Mexican and Oriental fruit flies. The latter invaded Hawaii from Saipan near the end of World War II. Desperate steps are being taken to keep it from U. S. shores.

In forest areas, where rangers protect a vital U. S. crop, Agriculture Department C-47's lay acres of insecticide fog. They fight the spruce budworm in Oregon and

Washington, pine bark beetles in Wyoming, gypsy moths on Cape Cod.

Entomologists believe they could eventually stamp out any variety of insect pest if they had funds for an all-out war. By soil poisoning and the so-called "muky disease" they can massacre the Japanese beetle. In Florida in 1929, a one-year blitz against the Mediterranean fruit fly blasted that dangerous invader off its beachhead completely. The cattle fever tick, once costing uncounted millions in livestock losses, has been virtually eliminated.

Complete Riddance Impossible

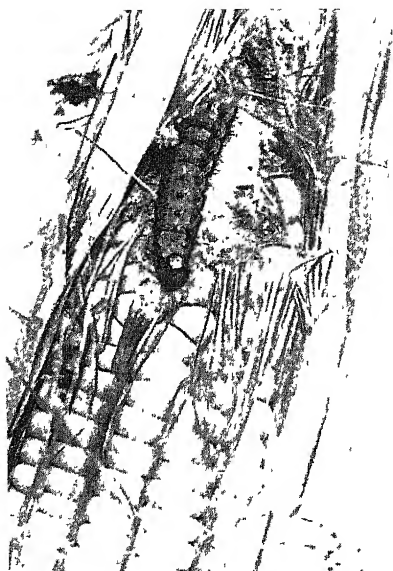
There are reasons they cannot rid the U. S. of all its pests: 1) It would cost billions, 2) There is the danger of poisoning crops themselves; and 3) They might kill insects which are the friends of man.

Bees and other insects carry the all-important pollen to many plants. But wild pollinating insects have virtually disappeared in many localities after new insecticides have been used. Crops compete for bees. The government is even experimenting with breeding pollinating insects to relieve the shortage.

Only in the case of major pest threats does the government itself enter the eradication battle. It contends itself with research, information services, promotion of the natural enemies of insect pests and quarantines.



GRASSHOPPER GANGSTER —
One of the ringleaders of the insect gang which will rob the nation of four billion dollars in 1950, the grasshopper, in closeup, with his cohorts can ruin entire fields of wheat or pasture ranges in a single day.



CHOMPING PEST—The corn earworm and European corn borer will ruin many a succulent ear of corn during the summer months.

between states and countries. County farm bureau agents advise the farmers how to meet the pests.

Against their best efforts, the bugs gain here and there. Over the nation this year, the loss will be close to the amount of Marshall Plan aid sent overseas. Farmers, then the public, will pick up the check.

Science News Letter, July 8, 1950

SOCIOLOGY

Do Non-Drinking College Girls Get More Dates?

➤ COLLEGE girls who do not drink have more dates than college girls who do drink—at least at the University of Rochester. This is in contradiction to findings of a survey made two years ago at the Pennsylvania State College, where the drinking girls had more dates than the non-drinkers.

At the University of Rochester, non-drinkers had an average of two and one-third dates in a two-week period, while drinkers dated an average of one and one-quarter times in the same period.

These figures were revealed in a survey conducted recently at the University of Rochester under the direction of Frederic C. Berezin, instructor in sociology, and reported by him and Norman R. Roth in the *QUARTERLY JOURNAL OF STUDIES ON ALCOHOL* (June).

A sample of 383 girls was used, 48 of whom did not drink and 335 of whom did.

The study also disclosed that, at the University of Rochester, drinkers and non-drinkers became engaged in about the same percentages. Two years ago, at Penn State

it was found that non-drinkers had the edge over drinkers in making a permanent attachment.

The Rochester study also found that sorority girls drank more than non-sorority girls on both dating and non-dating engagements. Another finding was that out-of-town girls who live in dormitories drink more than Rochester girls who have homes to go to.

The authors concluded that the findings of the investigation "raised more questions than they answered."

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MEDICINE

40 to 80 Cataract Cases In Atom Bomb Survivors

➤ ABOUT 40 certain cases of cataract and an additional 40 suspected cases have been discovered in atom bomb survivors by the Atomic Bomb Casualty Commission.

These make up the first evidence of the delayed effects of the atom bombings at Hiroshima and Nagasaki. Survivors have apparently recovered from the acute or immediate effects, such as loss of hair, temporary infertility and blood changes, the ABCC reports to the National Research Council and the Atomic Energy Commission in Washington, D. C.

The 80 certain or suspected cases of radiation cataract were discovered in a survey of 1,000 persons most of whom were within 3,000 feet of the point above which the bomb exploded. The survey was made after discovery of radiation cataracts among research workers in the United States who had been exposed to radiation similar to that released in an atomic bomb burst.

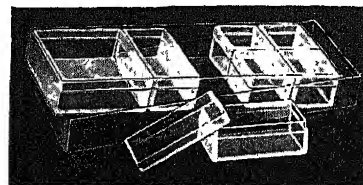
In the search for possible other delayed effects of the bombing on either survivors or their children, some 35,000 births have been investigated, a survey of 5,000 marriages has been made to determine the frequency of marriages between blood relations of varying degrees, about 2,800 children (some exposed to the bombs and some not) have been examined and medical examinations of newborn babies are being made at the rate of 700 and 800 a month.

Much of the effort of the ABCC has been expended in learning more about the normal state of health of the Japanese people in order to have a baseline of abnormalities occurring without atom bombing for comparison with those occurring in survivors of the bombings.

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ASTRONOMY

Why Mars Is Red

➤ THE red color of Mars is due to rocks on the surface of the planet that are naturally red colored

This was the view expressed in Bloomington, Ind., by Dr. Clyde Tombaugh, discoverer of Pluto and at present in charge of telescopic observations of V-2 and other rockets-in-flight at White Sands Proving Ground. He discussed the geological significance of markings on the planet Mars with members of the American Astronomical Society meeting.

Dr. Tombaugh believes that the lower temperature of Mars' surface, compared to the earth's temperature, may mean that the surface is little affected by chemical action and that the desert areas of Mars consist of rhyolitic igneous rocks, which are naturally red in color.

Some scientists have proposed that the red color of the planet is the result of oxidation of its surface by what little oxygen the atmosphere may have had at one time.

Rounded oases observed in many places on Mars could be the sites of impact craters caused by the collisions of small asteroids. Great dust clouds on the planet indicate the presence of wind, and wind erosion would smooth out the abrupt slopes of the impact craters.

These oases show seasonal change and a dark color. Dr. Tombaugh suggests that

vegetation similar to earthly lichens finds a favorable environment in the pulverized igneous rock and shelter offered by the crater of each oasis.

The idea of intelligent life as the maker of canals on Mars was definitely rejected by Dr. Tombaugh. He believes the canal-like markings are real, however, and that they can be seen by practiced observers.

The radial pattern of the canals with respect to the oases is attributed to fracturing of a thick crust under strain by the impact of asteroids that created the oases. The fractured zones could give haven to a hardy vegetation in regions of unfavorable environment, and at certain seasons this vegetation might absorb the slight moisture present in the Martian atmosphere after the polar caps evaporate and melt after each Martian year.

Mars is a planet about one-half the diameter of the earth. It requires nearly two years to go around the sun, and its average distance from the sun is about one and one-half times that of the earth. The temperature on the planet at its equator in the summertime equals in warmth only that of a spring day in the temperate zones of the earth. Recently Dr. Seymour L. Hess, at Lowell Observatory, has shown that weather changes may occur on Mars similar to those on the earth.

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fin and diathermy. The use of heat produces definite physiological effects which have been well substantiated."

Rest is an important part of the prescription, he said. Excessive exercise is to be avoided.

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BOTANY-PALEONTOLOGY

Seedlings Are Living Experiment of Dead Age

➤ SCIENTISTS have reached back 30 million years through time in a "live" experiment on a period of the earth's history known only through fossils.

Seedlings of the Dawn Redwood, recently found living in the interior of China after it had been thought to have been extinct for millions of years, play the leading role in this experiment.

The seedlings, germinated from seeds brought out of China two years ago, were planted last year in half a dozen locations in Alaska, where forests of the Dawn Redwood flourished in past ages.

Reports arriving in Berkeley, Calif., indicate that most of the young trees, covered by snow for many months, have survived one of Alaska's most severe winters. Of 66 seedlings planted, 46 are known to be alive—at Anchorage, Ketchikan, Cordova, Sitka and Juneau. Five have died and 15 are still under snow.

The past winter has been a good test of the ability of the trees to survive indefinitely in the Alaskan environment, says Dr. Ralph W. Chaney, professor of paleontology at the University of California, who initiated the experiments.

This is quite surprising to scientists, Dr. Chaney added, since it has been supposed that the Dawn Redwood required a milder climate. It now lives in a much milder climate in China. Furthermore, scientists have believed that the tree was driven out of Alaska and other northerly regions by the encroachment of cold in past ages.

The results are forcing scientists to question some opinions they have long held, Dr. Chaney said. For example, it now seems possible that the climate of the northerly regions where the tree flourished may have been colder than is generally believed.

The results also warrant speculations on the possibility that the climate of Alaska may now be gradually changing to a warmer one, Dr. Chaney added.

This year Dr. Chaney plans to extend the experiments. He will send 125 more seedlings to Alaska for planting in such places as the Aleutians and as far north as Fairbanks. He may also send seedlings to Iceland, Greenland and Spitzbergen, where fossils of the Dawn Redwood, called *Metasequoia*, have been found.

The scientist said seedlings of the *Metasequoia* are thriving especially well in California, where about 1000 have been planted.

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MEDICINE

Remedy for Aching Joints

➤ IF you are over 50, you probably have aching joints. But don't worry. Heat and rest will ease the pain and if you don't overdo at sports, you can probably go on working for many years.

This, in brief, is advice from Dr. Walter M. Solomon of Western Reserve University, Cleveland. He gave more details, in more technical terms, in his report to the American Medical Association meeting in San Francisco.

"Surveys have shown that practically everyone who lives to be 50 years of age or older will complain mildly or bitterly about one or more of his joints, with the vast majority of complaints due to the degenerative form," Dr. Solomon said.

The characteristic change in the progress of the disease is degeneration and the eventual wearing away of the cartilage, the gristle or white elastic substance attached to articular bone surfaces. This may take months or years. It is usually considered to be the result of wear and tear of life, Dr. Solomon pointed out.

"Since articular cartilage is insensitive, the pain is probably due to secondary changes in other structures, including such factors as muscle spasm brought on by stresses and strains, irritation of other tissues, such as bursae, tendons, and the like, the elevation of the periosteum (the tough fibrous membrane surrounding a bone) and loose bodies in the joints," he added.

"The physical measure most effective in relieving pain, stiffness and muscle spasm is heat in various forms, including infrared lamps, bakers, compresses, baths, paraf-

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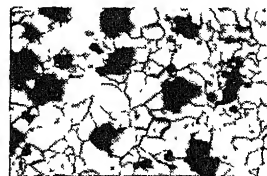
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Gila Monster

➤ GILA monsters are among the ugliest creatures alive. If the creatures were endowed with man's sensitivity to beauty and ugliness, it seems safe to say that the males and females would never be able to overcome their mutual repugnance, and the genus would simply die out.

Gila monsters belong to the genus *Heloderma*, and the two species are appropriately named *H. suspectum* and *H. horridum*. To all but the most avid gila monster-lovers (there are such people, as you will read further on), both species are equally suspect and horrid.

For one thing, the gila monster enjoys the dubious distinction of being the only lizard known to be poisonous. It is no hit-and-run poisoner like the snake. Once it strikes, it hangs on with all the tenacity of a bad conscience. While maintaining a bulldog grip, the gila monster works its jaws, apparently to insure that the venom from its grooved lower teeth gets into the wound.

In the Southwest where gila monsters are found, some people, possibly out of loneliness, make pets of them. It is said that after a few weeks of captivity, they become "reasonably tame" although they are still nervous and therefore not completely trustworthy.

However, reptile expert Dr. Raymond Ditmars tells us, "after a few months this nervousness wears away. Then they are the personification of good nature, permitting themselves to be handled in the most unceremonious fashion, without the least show of temper."

He offers one caution: Basking in warm sunlight seems to have the effect of reviving in even the most domesticated gila monster its former anti-social ways. A disturbed sunbather will bite the hand that feeds it or any other.

To scientists it is something of a puzzle just why the gila monster should be poisonous. Although it is sometimes known to kill small animals like mice, its principal food is believed to be eggs of snakes and other lizards. Obviously, poison is not necessary for stealing eggs.

The gila monster found in Arizona and

New Mexico has a short stubby tail. Its color is pink or orange with contrasting marks in black. In the Mexican and Central American species the tail is longer, the head is all black, and the light color

is a pale yellow. This species is sometimes called the beaded lizard, with the more familiar name, gila monster, being reserved for the United States species.

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ASTRONOMY

Cigar in Milky Way

➤ SOMETHING that looks like a slightly bent cigar has been seen in the Milky Way. It was reported by two astronomers in Ann Arbor, Mich.

While humorists hearing their report might have wondered whether it was tossed from a flying saucer, the astronomers themselves explained that the bent-cigar-looking object is an obscuring cloud or group of clouds of inter-stellar gas and dust.

The cigar-shaped object divides the Milky Way into two branches easily visible to the naked eye, the astronomers said at the dedication of the Heber D. Curtis Memorial Telescope of the University of Michigan.

The astronomers reporting this object are Dr. J. J. Nassau of the Warner and Swasey Observatory, Cleveland, and Dr. W. W. Morgan of the University of Chicago's Yerkes Observatory. For two years they have been studying stars of high surface temperature and great brilliance.

These stars are all at least 1,500 times as bright as our sun and many of them are over 10,000 times as bright.

The two astronomers suggested that our sun is located near the outer border of a spiral arm in our galaxy. If you can picture a large spiral pinwheel, made up of 100,000,000,000 stars intermingled with clouds of dust and gas, you can get some idea of our galaxy, commonly called the Milky Way.

The spiral arm in which we are located extends roughly from the constellation of Carina to Cygnus, the swan. This spiral arm contains the obscuring cloud. Other galaxies also appear to have spiral arms, they stated.

At the same meeting, Dr. Walter A. Baade of Mount Wilson and Palomar Observatories in California suggested that the Andromeda Galaxy, one of the closest to our own could serve as a model for studying ours.

The astronomers held a day-long symposium on the structure of the galaxy, bringing together what is known of it and discussing methods to improve our knowledge of it.

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OCEANOGRAPHY

Gulf Stream Meanders

➤ THE Gulf Stream does not stay put. It meanders far from its supposed course, sometimes doubling back on itself, sometimes looping so that it creates vast eddies which break off from the stream.

Rear Admiral Edward H. Smith, who recently retired after 40 years service with the Coast Guard and became director of the Woods Hole Oceanographic Institution, said that this view of the action of the Gulf Stream was confirmed by a recent six-vessel survey of the current. He spoke over the Columbia network as guest of Watson Davis, director of Science Service.

Adm. Smith said that the new knowledge of the Gulf Stream was due in great part to the use of loran—a war-developed radio system of navigation—which permits survey ships to fix their positions as often as they wish. Before loran was introduced it was only possible to achieve accurate fixes twice a day, he said, and thus only the net effect of a current over a half day was known.

"Probably the Gulf Stream is an extreme case," Adm. Smith said. "When other currents are studied as intensively as the Gulf Stream has been studied, it may be found

that they are somewhat steadier. However it is already clear that the variability of the ocean circulation is much greater than had been anticipated."

Right now, Adm. Smith said, oceanographers are studying the how and why of currents. After that picture is clear, the job will be to find out how currents affect the weather. He pointed out, however, that the Gulf Stream would have an effect on the weather in Europe, not in the United States.

"Ocean circulation is much like air circulation," Adm. Smith said, "but it is much slower. A week in the ocean is apparently equivalent to a day in the air, so far as circulation is concerned."

The new director of the Woods Hole Institution said that oceanography is just about entering the phase where it can begin to forecast ocean circulation. With new investigational techniques and instruments, he concluded, oceanographers will be able to describe the movements of the ocean accurately and will be able to understand just what sort of an ocean we are dealing with.

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Books of the Week

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COLLEGE CHEMISTRY: An Introductory Textbook of General Chemistry—Linus Pauling—*Freeman*, 705 p., illus., \$4.50. Well illustrated.

CONTROL OF ODORS—Elmer R. Weaver—*Gov't Printing Office*, Nat'l. Bureau of Standards Circ. 491, 12 p., paper, 10 cents. General information on the practical control of industrial and household odors.

THE CRUSTACEA DECAPODA MACRURA COLLECTED BY THE ARCHBOLD NEW GUINEA EXPEDITION: Results of the Archbold Expeditions No. 63—L. B. Holthuis—*American Museum of Natural History*, 17 p., illus., paper, 25 cents.

CURRENTS IN NUTRITION: Proceedings of the Nutrition Symposium held at The University of Illinois, College of Medicine, Nov. 19, 1949—Bertha Burke and others—*National Vitamin Foundation*, 128 p., paper, \$1.00.

DIETS OF FAMILIES IN THE OPEN COUNTRY. A Georgia and an Ohio County, Summer 1945—Sadye F. Adelson and Ennis C. Blake—*Gov't. Printing Office*, U. S. Dept. of Ag., Misc. Publ. No. 704, 90 p., illus., paper, 25 cents.

EXERCISES IN GENERAL CHEMISTRY—Harold G. Dietrich and Edwin B. Kelsey—*Macmillan*, 285 p., illus., paper, \$3.00. An introductory college laboratory manual.

INTRODUCING THE INSECT—F. A. Urquhart—*Holt*, illus., \$5.00. Describes the habits and classifications of insects. For the layman and the college student taking his first course in entomology.

MANAGEMENT OF INDUSTRIAL RESEARCH: A Selected and Annotated Bibliography—*Arthur D. Little*, 14 p., paper, free upon request to publisher, Memorial Drive at Kendall Square, Cambridge 42, Mass.

MEGASPORES FROM THE MICHIGAN COAL BASIN—Chester A. Arnold—*University of Michigan Press*, approx. 55 p., illus., paper, \$1.50. A report of spores found on coals and shales which were formed in the early Pennsylvania age.

A NEW TESTUDO FROM MADISON COUNTY, MONTANA—Thomas M. Oelrich—*University of Michigan Press*, approx. 15 p., illus., paper, 50 cents. A report on the discovery of a new species in the Miocene deposits of Madison County, Mont.

NUTRITION IN OPHTHALMOLOGY—John J. Stern—*National Vitamin Foundation*, 137 p.,

paper, \$1.50. Effects of different vitamins upon the eyes are discussed.

THE OVERTHROW OF THE PHLOGISTON THEORY: The Chemical Revolution of 1775-1789—James Bryant Conant, Ed.—*Harvard University Press*, Case II, 59 p., illus., paper, 90 cents.

THE PLANET MARS—Gerard de Vaucouleurs—*Faber and Faber* (U. S. Distributor: Macmillan), 87 p., illus., \$2.00. A monograph discussing many of the aspects of the planet Mars. Translated from the French by Patrick A. Moore.

PRE-TRAVERSE DEVONIAN PELECYPODS OF MICHIGAN—Aurele La Rocque—*University of Michigan Press*, approx. 100 p., illus., paper, \$2.00. The results of a study made by the author.

RESEARCHES ON THE AMPHIBIA OF OKLAHOMA—Arthur N. Bragg and others—*University of Oklahoma Press*, 154 p., illus., \$1.00. A study of the taxonomy, ecology and sex cycles of amphibia in Oklahoma.

ROBERT BOYLE'S EXPERIMENTS IN PNEUMATICS—James Bryant Conant, Ed.—*Harvard University Press*, Case I, 70 p., illus., paper, 90 cents. First of the Harvard Case Histories in Experimental Science designed to acquaint students who are majoring in the humanities or the social sciences with major events in science.

STRANGE SEA LIFE—Gladys Vondy Robertson and Vera M. Graham—*Holt*, 115 p., illus., \$2.50. The authors tell something of the interesting creatures found in the salt waters that encircle the world. For the layman.

THE SUPPLY AND DEMAND FOR GEOLOGISTS 1949-1950—William B. Heroy, Chairman—*American Geological Institute*, approx. 11 p., illus., paper, free upon request to publisher, 2101 Constitution Ave., N. W., Washington, D. C. A survey appraising the employment prospects in the geological field.

TEACHING BIOLOGY FOR APPRECIATION—Alfred F. Nixon—*Chapman & Grimes*, 143 p., illus., \$3.00. The author discusses different methods of teaching biology in secondary schools.

Science News Letter, July 8, 1950

MEDICINE

Blood Chemicals Used to Remove Kidney Stones

➤ CLOTTING chemicals from blood can be used to remove kidney stones without cutting open the kidney surgically.

The blood chemicals are fibrinogen and thrombin. Injected into the kidney through the tube from kidney to bladder, the chemicals form a clot around the stone making possible its withdrawal.

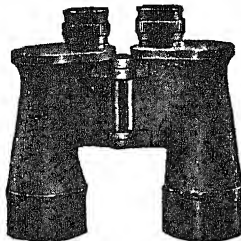
Doctors saw this new technique in a moving picture shown by Col. J. C. Kimbrough and Maj. Robert B. Rowe of Walter Reed General Hospital at the meeting of the American Medical Association in San Francisco.

Science News Letter, July 8, 1950

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⚙️ **TABLE TENNIS device**, for solo practice with a machine partner, has a net at one end of the table to catch the ball and drop it into a trough below. The ball then rolls into a device which shoots it, by vacuum-cleaner air-pressure, through a curved tube onto the table.

Science News Letter, July 8, 1950

⚙️ **GASOLINE TANKS** to fit into the waste fender area behind each rear wheel of the automobile make the customary gasoline tank space available to add to the baggage compartment. The simple idea, for which a patent is pending, does not change center of gravity or gasoline capacity.

Science News Letter, July 8, 1950

⚙️ **TRAILER COOLER**, electrically operated, is designed to circulate filtered, cool air directly down through a ceiling ventilator. The 90-pound device, complete with motor, blower, water-pump and accessories, is easily mounted on top of the trailer and no ducts are required for installation.

Science News Letter, July 8, 1950

⚙️ **VOLT-AMMETER** for the electrician is built to measure current without interrupting service. As shown in the picture,



this 12-ounce pocket instrument, in a plastic case, features two insulated split-core transformer probes which are opened by a plastic trigger to close around conductors.

Science News Letter, July 8, 1950

⚙️ **CLASSROOM LANTERN** slide, two-

by-two inch size, is made of a specially treated glass which can be written on by an ordinary pencil. Markings on it can be erased at will, making the slide usable over and over again.

Science News Letter, July 8, 1950

⚙️ **ELECTRIC HARPOON** for killing whales, developed in England and successfully used in the Antarctic during the past season, is attached to the vessel by a line which carries an electric current. This humane device kills almost instantly and saves time for the whalers.

Science News Letter, July 8, 1950

⚙️ **JUNIOR RECTIFIER**, low-cost instrument to deliver six-volt direct current from the ordinary 115-volt alternating current line, utilizes new heavy-duty selenium rectifiers plus accessories such as voltmeter and ammeter. It is designed for testing and demonstrating low-voltage devices.

Science News Letter, July 8, 1950

⚙️ **CANASTA SCORE** makes the progress of the game easy to keep by advancing pegs in holes opposite each side of the score values. Adding is done automatically on this durable plastic device, and the score is always visible to all players.

Science News Letter, July 8, 1950

Do You Know?

Ground corn cobs make an excellent material for garden mulch.

A pound of *earthworms* contains all the way from 120 night-crawlers known as glow worms to about 900 garden worms.

The *chigger*, a little red speck of a bug with a big bite, is really a mite and belongs to the same family as spiders, ticks and scorpions; it is often called the red spider.

Following the gigantic eruption of the volcano Krakatoa in Java in 1883, resulting dust in the atmosphere caused gorgeous sunsets as far away as England for months afterward.

The Dionne Canadian *quintuplets*, born in 1934, and the Diligenti set of five, born in Argentina in 1943, are the only two known cases of quintuplets who survived infancy.

Many names of *stars* are Arabic; this is because during the so-called dark ages in Europe, the Arabs cultivated a knowledge of the heavens and translated former Greek names into their language.

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JULY 15, 1950

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Recoilless Rifle

See Page 35

A SCIENCE SERVICE PUBLICATION

GENERAL SCIENCE

Scientists to Be Drafted?

It is hoped that scientific talent will not be misused due to the draft. Draft boards now decide if a man is essential.

➤ SCIENTISTS hope Selective Service this time will put no scientists or promising science students on KP. They remember misuse of scientific talent during World War II and, in light of the much greater need for full utilization of our science brain power today, they hope Selective Service and the Armed Forces have learned their lesson.

Putting it most politely, Dr. Detlev W. Bronk, president of the National Academy of Sciences, expresses the hopes of scientists this way: "The administration and Congress have during the past years wisely recognized the important role of science and scientists in the maintenance of our military strength and security. They have given strong support to scientists in their efforts to prepare for such an emergency as this. Accordingly, I am confident that the draft act will be administered in such a way that our scientists will be utilized where they can most effectively serve our country. I am confident too that the training of scientific students who will be necessary for the security and welfare of our nation will not be interrupted."

As of now, there is no special provision for scientists or scientific students in the draft law or in selective service regulations. It is up to the local boards to decide whether a man is in an essential occupation. Either the prospective draftee or his employer or, if he is in college, a college official, can ask for deferment. Many scientists who are otherwise eligible for the draft are reluctant to ask for deferment. They feel they should be ordered to do the work for which they are most fitted and which is most valuable to the nation.

Early in 1949, a study made for the General Staff of the Army with the cooperation of nearly 5,000 veterans who were scientists, declared that, if these 5,000 soldier-scientists had their way, the present selective service system would not have jurisdiction over the utilization of scientists in the armed forces in another emergency. Over half the 5,000 strongly advocated some national agency to allocate and assign the scientists to jobs they could best do in war, whether in uniform or civilians.

Maj. Gen. A. C. McAuliffe—of Bastogne fame—declared in the report: "Scientists constitute an exceedingly small segment of the national population. They compose less than 2 per cent of the Armed Forces, but the military functions dependent on their specialized skills and knowledge are highly disproportionate to their num-

bers. The small numbers involved and the great complexity of scientists' experience and training require the use of special measures to assure their maximum utilization."

Gen McAuliffe, at the time, was deputy director of the Army's research and development.

Although there is no deferment for students in the medical field, a memorandum has gone out to local boards advising them that students in medical, dental, veterinary and osteopathic fields are in a class where there is a shortage. Physicists, chemists, engineers and students in those vital fields do not even have this protection.

Science News Letter, July 15, 1950

GENERAL SCIENCE

Korea, Oft Invaded, Was Cultural Bridge

➤ AT the entrance of many country towns in Korea can be seen curiously carved posts, representing the Five Point Generals. These Generals are supposed to prevent the entry of evil spirits from the five points of North, East, South, West and Center. It must be said that the Generals have not done too good a job for Korea down through the ages.

Korea is a land of 86,000 square miles and about 25,000,000 people. Less than half the land is below the 38th parallel, which divides the Russian-sponsored North Korean Republic from the American-sponsored South Korean Republic. But more than two-thirds of the people live below that crucial parallel.

Koreans are presumed to be of the Mongol family although no one is quite sure. There have been additions to the original stock of both Caucasian and Malayan strains. They are distinct from both the Chinese and Japanese in looks.

Korean history began with somebody named either Dan Koon or Tangun, who began his rule of the country in either 2257 B.C. or 2333 B.C. He founded a dynasty which lasted 1050 years. He taught the uncivilized people of Korea agriculture and the art of building and introduced the beginnings of a religion.

There was no name for the whole peninsula in those days. It received a name which probably sounded something like Chosen when Ki-tze emigrated from China with several thousand followers. He founded a dynasty which lasted another thousand years. The name Korea is derived from the

Koryu dynasty which lasted from 918 to 1392 A.D.

During all this time, the influence of China on the culture of the Koreans was quite marked. Literature of the higher class was exclusively in Chinese characters, although an ingenious 25-letter alphabet with 11 vowels and 14 consonants was developed for everyday use.

The Koreans were a sort of bridge for the transmittal of culture and religion from China to Japan. The Japanese paid for these favors by trying to conquer the land, beginning with pirate raids and then in 1592, staging a 300,000-man invasion.

This invasion would have succeeded had not the Koreans produced an admiral with a little of Sir Francis Drake in him and a flair for inventions. This admiral, Yi Sun Sin, invented the first iron clad naval ships. They looked like turtles, propelled by oars, and fire arrows emanated from port-holes in the sides. With these ships, the Admiral cut the Japanese invaders off from their transports and finally routed and destroyed the Japanese navy. The Koreans did not see the Japanese again for 300 years.

Korea is a mountainous land, with very few plains worthy of the name. Everybody says its climate is delightful, although there is a rainy season which lasts through July and August.

Most of its rivers are shallow and rocky. The Han, however, which just about bisects the country below the 38th parallel, can be navigated for 150 miles.

Science News Letter, July 15, 1950

MEDICINE

Two Modern Drugs Fail in Polio

➤ HOPE that an effective treatment for poliomyelitis might have been found in two modern drugs is dispelled by reports to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (June 10).

The drugs are the sulfa drug, phenosulfazole, also called darvisul, and the antibiotic, aureomycin.

Phenosulfazole was given to 29 patients with bulbar and spinobulbar polio during the 1948 epidemic in Milwaukee. The mortality rate in this group was 34.5%, compared to 42.1% in a group of 19 similar patients who did not get the drug. Reporting this, Drs. Max J. Fox and Evans Z. Hornberger, Jr., state that the difference is not statistically significant and that there appeared to be no difference in the length of time the patients had fever and had to stay in the hospital.

The aureomycin trials are reported by Drs. Emanuel Appelbaum and Raymond Saigh of New York. The drug was given to 38 patients with nonparalytic polio, 66 similar patients not getting the drug and serving as controls. The results were about the same in both groups of patients. The drug did not seem to affect favorably the clinical course of the disease.

Science News Letter, July 15, 1950

MILITARY SCIENCE

War Weapons in Korea

Korean fighting techniques are not utilizing discoveries of World War II. However, new weapons may soon make tank warfare obsolete.

See Front Cover

► WARFARE in Korea came too early for the scientific promises of new defense weapons to be fulfilled. Secretary of the Army Frank Pace, Jr., speaking at West Point's commencement in June, declared: "With guided missiles and rockets, target-seeking equipment and the possibility of tactical use of atomic weapons, it may well be that tank warfare as we have known it will soon be obsolete."

The North Koreans, with their tank-led advances, are now proving that "tank warfare as we have known it" is not yet obsolete.

The Korean war, in fact, has used little even that was learned by scientists during World War II. The retreat of the South Koreans dates back more to the rout of the French in 1940 than to the end of World War II.

Even the fast jet planes, developed largely since the end of World War II, have proved unsuitable both in ground support of the South Koreans and in combat against the much slower Russian Yaks.

The problem seems to be not whether our side is taking advantage of the scientific advances in warfare since 1945, but whether our side can use to any advantage at all the weapons that are available.

Bazookas—recoilless weapons easily man-geable by one or two infantrymen—were developed during World War II. They are said to be extremely effective against tanks. The United States turned over to the South Koreans more than 2,000 anti-tank bazookas with 40,000 rounds of ammunition when American troops left a year ago. Their presence in South Korea had little effect on the first advances of North Korean tanks. The question seems not to be whether they were effective but whether they were used at all by the South Koreans.

Early in June the Army Department determined on a policy of revealing some of the scientific advances in new defensive weapons, hoping thereby to bolster the morale of western Europe. It was said that, with these new defensive weapons, in time western Europe could defend itself against the superior manpower of Soviet Russia.

The weapons mentioned included guided missiles, atomic warheads in artillery, 75 millimeter recoilless weapons, as shown on this week's cover of SCIENCE NEWS LETTER, new versions of the bazooka. One of the results of this war may well be to speed

up development and production of these new defensive weapons.

Science News Letter, July 15, 1950

AERONAUTICS

Missile Models Give Data Of 6,000-Mile Speed

► WRAPS were removed at Moffett Field, Calif., from a new and unusual wind tunnel in which tiny models of missiles are fired from guns against a powerful air current to provide the equivalent of speeds of some 6,000 miles per hour.

The new installation, known as a supersonic free-flight wind tunnel, is at the Ames Aeronautical Laboratory of the National Advisory Committee for Aeronautics. Additional equipment to be installed will permit aerodynamic studies up to 11,000 miles per hour, approximately 15 times the speed of sound.

The tunnel is already in use to study the characteristics of missile-type models at

high supersonic speeds. The models used are only a few inches in length but with this tunnel, research results obtained are comparable with those for far larger models. Conventional wind tunnels would require a model more than 10 feet long.

The hypersonic speeds in this free-flight tunnel are achieved by generating an air stream of from two to three times sonic speed and launching the model into this oncoming air stream at high velocities. Launching guns vary from .22 caliber up to three inches.

In the gun barrel, the model is housed in a tiny carrier which protects it from the hot discharge gases, keeps it properly aligned during launching and acts as a piston. Once out of the muzzle, the carrier falls away, leaving the model free to fly by itself through the tunnel.

The tunnel is of the type known as a "blowdown." The air is supplied by an adjoining 12-foot pressure tunnel at a maximum pressure of six times that of the atmosphere. The air passes through a settling chamber, supersonic nozzle, test section and diffuser and thence into the open air. Guns to fire the models are placed in the diffuser.

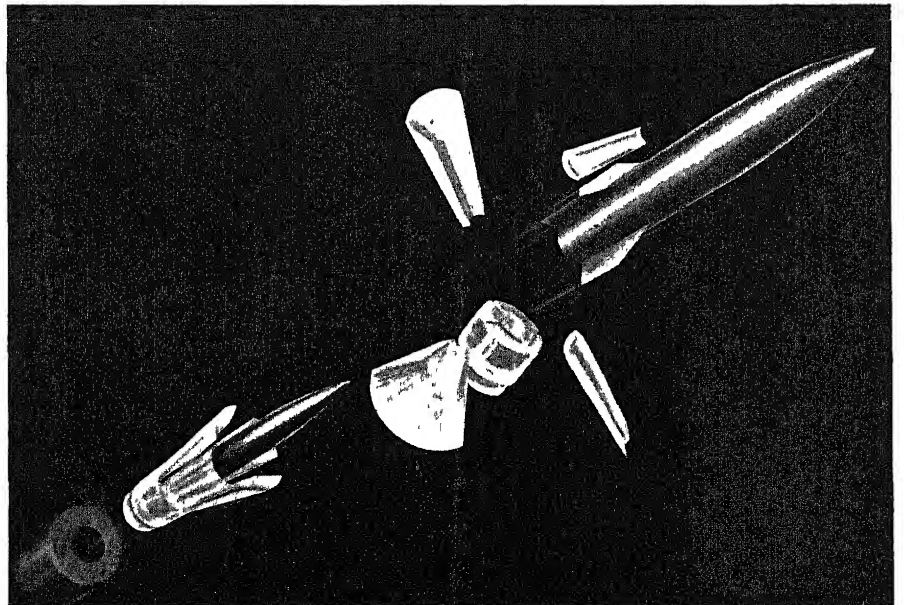
Science News Letter, July 15, 1950

PHYSICS

Say "Fishing" to Use All Speech Sources in Mouth

► SAY "fishing" and you will run the gamut of apparent sources of speech in your mouth.

Two Radio Corporation of America sci-



SABOTS SEPARATE—Models launched from guns in the new NACA wind tunnel leave the gun barrel in plastic "sabots" which keep the models correctly aligned and act as pistons on firing. When the model leaves the gun muzzle, the sabot separates and falls away, leaving the model free to continue its flight through the test section, where measurements are made.

entists measured the apparent location of the point sources of sound in people's mouths and came up with the tentative conclusion that the sound of "f," for instance, comes from only one-twentieth of an inch behind the lips. But the "ng" sound comes from farthest back—one and one-tenth inches behind your lips.

They made the measurements because certain microphones discriminate against sound from a distant source with respect to sound from a close source.

In all, 38 standard sounds—each ranging over 18 frequency bands—were measured. It was found that the unvoiced consonants like "f," "k," "p," "h" and "t" come from closest behind the lips; vowels are mostly in the middle, from a half to three-quarters of an inch back; and semi-vowels, like

"a" as in pan and "o" as in pole are farthest back.

"Ng" seems to be an exception to all the rules. It is farthest back but, instead of retreating into the mouth as the frequency of the sound rises, as most other sounds, it gets closer to the lips.

According to the data in this study, the sound of "Truman" comes from a greater area in your mouth than the sound of "Dewey."

The scientists are Mones E. Hawley and H. H. Kettler of the government sound engineering section of RCA's Victor Division. Their study was published in the JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA (June 6).

Science News Letter, July 15, 1950

and adjusting computations until the desired design change is produced on the plotting board.

Science News Letter, July 15, 1950

RADIO

Saturday, July 22, 1950, 3 15 p.m., EDST

"Adventures in Science" with Watson Davis, Director of Science Service, over Columbia Broadcasting System.

Mr. Davis will continue his discussion "Our Atomic Future."

SCIENCE NEWS LETTER

VOL. 58 JULY 15, 1950 No. 3

45,600 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W. Washington 6, D. C., North 2255 Edited by WATSON DAVIS.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925, 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to periodical literature, Abridged Guide, and the Engineering Index.

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MATHEMATICS-ENGINEERING

Giant Brains Shrink

➤ "GIANT brains" are shrinking in size but not in efficiency. The newer complicated electronic computers, that solve mathematical problems in seconds that otherwise might take weeks or months, require less space and cost less money.

One of the newest, office-size, "tests" equipment even before models are made. It is the REAC. Spelled out, it is the Reeves Electronic Analog Computer.

It was developed by Claude Neon, Inc., in its research center, the Reeves Instrument Corporation. Harry D. Belock is the inventor. It is an outgrowth of U. S. Navy guided missile work and, while relatively new, is already in production and in use in aircraft and other laboratories.

The role of the REAC in industry and science, ranging from aircraft to television, is that it makes economically feasible the solution to a wide range of the most intricate mathematical problems. In the automotive field it solves problems with respect

to internal combustion engines in performance, ignition and carburetor development work and improvements in a car's riding ability.

In engineering it computes problems with respect to bridge vibrations, stress analyses and many other matters.

The REAC specialty is solving what mathematicians know as differential equations. The equations used usually describe the motion of a body in space, motion of the links in a mechanism, and the like, as a function of time. Their solution results in an accurate picture of the particular dynamic motion under a desired variety of conditions.

The standard REAC, in appearance, looks like any conventional type of telephone switch board. It consists of a computer unit, a servomechanism unit, a recording unit and an associated power supply. Equations are plugged into the board. This simple method facilitates changing equations

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Photographs: Cover, U. S. Army; p. 35, National Advisory Committee for Aeronautics; p. 39, U. S. Army; p. 48, Bell Telephone Laboratories.

MEDICINE

Banthine for Ulcers

This chemical effectively treats even peptic ulcers of long standing. General distribution of the drug is now planned in order to make general use possible.

➤ ULCERS of the stomach can be treated successfully without surgery through use of a new chemical, called banthine

Even peptic ulcers of considerable severity and long standing were relieved and healed by banthine doses in the clinical trial reported by a team of Duke University physicians to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (July 8)

The effect on symptoms of patients using banthine, usually four doses by mouth a day, has been "gratifying," Drs Keith S. Grimson, C. Keith Lyons and Robert J. Reeves report. The treatment promptly relieves the pain of ulcer and those originally incapacitated, with only two exceptions, returned to regular work

In the test series of a hundred patients, 50 of the 55 who would conventionally require surgery have not required an operation. Of 38 patients with duodenal ulcer without indications for surgery, 34 are now able to eat regular food.

Banthine, the drug used in the ulcer

treatment, is a quaternary ammonium compound with the long chemical name of beta-diethylaminoethyl xanthene-9-carboxylate, and it is used as the methachloride or methabromide. Because of the encouraging

MEDICINE

Tools Help Blind See

➤ ELECTRONIC pencils which "read" to blind people, a typewriter which communicates with the deaf-blind, a magnifier based on television principles, these are some of the instruments shown in Philadelphia to a research session of the American Association of Instructors for the Blind.

Many of the new tools to help the blind "see" are complicated arrays of electronic tubes, and some of these have not yet been perfected. But a simple attachment to a typewriter, without any electronic tubes, enables a person who can type to talk with

results obtained in the Duke Medical School tests, general distribution of banthine is planned in order that physicians may now use it. The drug is produced by G. D. Searle & Co., Chicago.

The usual schedule used by the Duke doctors in treating ulcer patients was 100 milligrams every six hours day and night. After three to eight weeks when healing has occurred, patients decrease the amount of banthine taken to 50 milligram doses, or 200 milligrams a day, continuing this indefinitely. They go back to larger doses if pain again develops under tension, strain or illness

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any deaf-blind person at the speed he can type.

The attachment is a little box containing a reel on which are printed the Braille characters. The blind-deaf person places his finger on a hole in the top of the box and as his friend types a letter on the typewriter, it is brought up to the hole and the blind-deaf person "reads" it with his finger.

The instrument was developed by the technical research division of the American Foundation for the Blind.

Three "guidance" devices which use the techniques of radar to warn blind persons of obstacles were demonstrated. However, the demonstrators emphasized that all the devices are still in the experimental stage and need a great deal of work before the average blind person can use them.

The results of tests with a "reading pencil" developed by Dr. Vladimir Zworykin of the R. C. A. Laboratories were reported to the session by a member of the staff of the Institute for Human Adjustment at the University of Michigan, Dr. Emily Willerman. She and Dr. Wilma Donahue found that, with the pencil, a blind person can learn to read ordinary print and typewritten copy.

The pencil, pointed at a letter, translates the shape of the letter into a distinctive noise which is heard by the blind person through a hearing aid.

Changes in type, however, are confusing and it usually takes additional instruction when the style of type is changed. In about 25 hours, the average blind person can achieve a vocabulary of about 190 words which can be read in sentences.

The first experimental model of an electronic magnifier for almost blind persons, demonstrated at the session, was based on television principles. A small oscilloscope, in an instrument about the size of a flashlight, scans the type to be magnified and it is then transmitted to an ordinary tele-



READING PENCIL—Nancy Bradley, 8, Kenwood, Pa., who was totally blinded in a sledding accident when she was five, tries out an electronic stylus, a "reading pencil," developed by R.C.A. The pencil translates letters in a line of type into recognizable sounds. Dr. Emily Willerman, of the University of Michigan, shows Nancy how to operate the mechanism.

vision screen. It magnifies 15 times, which means that about three letters would fit on a five-inch television screen.

Developed at the Franklin Institute, from stock parts, the demonstrators stressed that many factors have yet to be worked out

before it can be determined whether the magnifier is practicable

The meeting was held at the Franklin Institute with Dr. Gabriel Farrell, director of the Perkins Institution, Watertown, Mass., as chairman.

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PHYSICS-CHEMISTRY

Atoms Make Direct Picture

➤ **EXPLODING** atoms that set off a "chain reaction" in your camera, giving you a direct print of the picture you are taking, are promised from a new light-sensitive process just announced.

This direct photo print-out paper will be commercially possible when some way is found to make stable the chemical, nitrogen iodide. This is the light-sensitive compound that has been found to do the trick usually done by a silver chemical

A photo-print is made when a light flash hits paper that has been coated with small amounts of a light-sensitive chemical. Dr. J. Eggert, of the Photographic Institute of the Eidgenossischen Technischen Hochschule in Zurich, discovered that nitrogen iodide is a very efficient photo-chemical. For his most valuable contributions to photographic science Dr. Eggert was presented the Progress Medal for the years 1949 and 1950 of the Royal Photographic Society of England.

When nitrogen iodide is coated on paper in very tiny amounts and then exposed to a high intensity light flash, the tiny particles explode, making the photo-print. This process is 1000 times faster with nitrogen iodide than when ordinary print-out paper is used.

Although commercial development of the process must wait until nitrogen iodide can be made more stable, pictures using nitrogen iodide finely dispersed on paper

have been made experimentally. The paper looks black before the print. Where each unit of light energy, or quantum, explodes the particles of nitrogen iodide, the paper turns white.

This process is highly efficient, since each quantum of light explodes more than one molecule of nitrogen iodide. Or, as Dr. Eggert reported to the third international conference on "Fundamental Mechanisms of Photographic Sensitivity," the "primary quantum efficiency of nitrogen iodide as a photo-chemical is much better than one." Just how efficient it is depends on the amount of the chemical that is dispersed on the paper.

The keeping quality of the photo-prints made by this process is limited to a day or so, Dr. Eggert reports. The image can, however, be converted to a silver one that then keeps as long as normal prints.

The photographic quality of the prints now being made experimentally is similar to that obtained by Xerography at the time that process was disclosed in October, 1948. Xerography is a completely dry process for taking and printing pictures.

Although it has been known that nitrogen iodide was unstable to heat and that it explodes under mechanical pressure, Dr. Eggert's researches have proved that the quick change in the chemical when exposed to a light flash is not due to the heat of the flash.

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will look at them, admire them, and so be helped in remembering

If the left-handed child is old enough to go to school and learn to write, the problem of training him in right-handedness is a little different. Whether he should be changed over depends, advises Dr. Hildreth, on how fixed his left-handed habits have become and whether the re-training will cause nervous tension. After a child has been writing in school for a year or more with his left hand it is usually too late to re-train him

But he should not be left to "nature" If it is decided that he is to be left-handed, then he should be given special training so that he will write well with his left hand. Start him at the blackboard, not with paper, Dr. Hildreth advises. If he stands at the extreme left end of the board to start his writing, there will be no temptation to write backwards, mirror-fashion. And he will not be likely to crook his wrist around at an awkward angle. This is done by the left-hander writing on paper so that he can see what he is writing

When he starts writing on paper, give him a pencil, not a pen, to work with and turn his paper at an angle the reverse of that used by the right-hander. A slope-top desk is a help.

If a child or an adult loses the use of his right hand it is not too difficult to train him to use the left. War veterans have been taught left-handed writing in five to ten days. Teach the child to use his left hand first to tap with a hammer. Then he should follow the edges of openings cut out like a stencil in a sheet of copper. Later he should practice on the blackboard and finally on paper.

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ENTOMOLOGY

Fly Destroys Central American Corn Crops

➤ A **FLY** which destroys whole fields of Central American corn each year, yet is little known to science, is being studied in Guatemala by experts from Iowa.

Men who know corn, researchers at Iowa State College's Tropical Research Center in Antigua, Guatemala, report the new insect pest is so destructive that it can ruin 98% of a stand of corn in a single heavy infestation.

The fly's scientific name is *Euxesta major*. It does its damage while still in the larval stage. The young worms bore down into the growing cornstalk and either kill the stalk outright or leave it dwarfed and bent.

The fly maggot is currently at work, it is believed, from Costa Rica north to Mexico. U. S. Department of Agriculture specialists say there is no indication that *Euxesta major* exists in the United States.

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PSYCHOLOGY

Train Baby's Right Hand

➤ **MOTHERS** should not leave it to "nature" whether the baby is to become a "southpaw" or right-hander. The mother should train her baby to right-handedness beginning in the cradle or high chair.

This is the advice of Dr. Gertude Hildreth, of Brooklyn College, psychologist who has made a special study of handedness and its effect on stuttering and other defects.

No baby is born left-handed, she reported in the *JOURNAL OF GENETIC PSYCHOLOGY* (March). The little baby will pick up objects with either hand or both. Right- or left-handedness is the result of training, conscious or unconscious.

The training should be unobtrusive and no mother should make a scene and grab

a toy away from the baby who has taken it in his left hand. Nevertheless, she should be persistent in encouraging use of the right hand. When you give a baby a toy, put it in his right hand. When he learns to feed himself, have him hold his spoon in his right hand. Place articles that he is going to use on the baby's right. Put the crayon in his right fist.

It is no use to tell a child, "Use your right hand," Dr. Hildreth warns. In the first place, the training should be done before the child is able to talk. In the second place a child under six cannot be expected to know right hand from left. If you want him to remember, put a bright ribbon on his right arm, or give the little girl a pretty bracelet to wear on her right wrist. They

MEDICINE

From Now On: Viruses

Colds and influenza may succumb to science in the future. Synthetic viruses may afford devastating weapons of ruthless warfare.

By WATSON DAVIS

Sixteenth in a series of glances forward in science.

► THE causes of influenza, infantile paralysis, the common cold and a number of other common and uncommon human diseases are viruses. These organisms, tiniest of the disease troublemakers, are the least conquered as a general group.

It used to be said that the viruses were invisible and that they could be recognized only by their evil deeds and their ability to pass through small space that would stop a bacterium. That is no longer true, for the electron microscope has allowed us to "see" a variety of shapes and forms that are evidently organisms that cause these diseases.

While some of the newer disease-treating drugs, such as aureomycin, seem to be effective against some of the virus-caused ills, such as virus pneumonia and parrot fever, the viruses that cause flu, polio and colds, to pick the most prominent, have not yet been conquered chemically.

Much research is being done on the viruses, but the blind alleys are many and the difficulties are complex. Much of the exploratory work has been done on plant diseases, many of which are virus-caused. But there is no assurance that many things learned through use of sick tomato plants will do more than furnish good leads.

There has been the intriguing possibility that cancer—or at least some forms of it—may turn out to be a virus disease. Some cancer-like diseases in animals certainly are. Smallpox is caused by a virus, but since it is prevented by vaccination there is less incentive to work on it. Among other virus diseases are mumps in humans and Newcastle disease of fowls.

A virus is, of course, a parasite, just as are bigger germs. It has to multiply in the cells of the body it invades, it must travel from one sick person to another and it must be able to persist in its invasion of the host.

Epidemic influenza is perhaps the most dangerous of the viruses, although the common cold would surpass it in the lost time and human misery that it causes.

The great pandemic of influenza of 1918-19 has not been repeated, but this may happen in the future. Dr. C. H. Andrewes, the British virus authority, observes that influenza seems to be a megalomaniac virus that likes to operate on a world-wide scale. He suggests that civilization, with its air travel that mixes up all peoples and their

viruses, may keep our immunity to influenza so high that another world epidemic will be avoided.

In the virus situation, the cold war between the East and the West would not seem too important. Yet Dr. Andrewes suggests that if political troubles cause a further division of the world into two separate camps, different strains of influenza might become dominant in each half. In that case, the Soviet and the Western viruses having no political preferences, might each seize the opportunity to conduct a natural biological warfare.

As to the viruses in our future, we may expect:

A. The possible development of new chemicals that will treat or prevent some of the unconquered virus diseases, even influenza and the common cold. A new antibiotic or other chemical may be found to tackle successfully several viruses, or specific chemicals may be produced for each disease.

B. New kinds of synthetic viruses may be devised once scientists know enough chemically about the natural ones, and these might create dangerous disease weapons in ruthless warfare, which would be slower but perhaps more devastating than atomic bombs.

C. Understanding the viruses, that are

often considered to be on the borderline between the living organisms and non-living chemicals, may throw light upon the nature of life itself.

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ENGINEERING

Pumps Supply Fuels to Forward Combat Areas

► LIQUID fuels for military operations in forward combat areas will be more certain with two improved portable pumps developed in Fort Belvoir, Va., by the Army Engineer Research and Development Laboratories. They are usable also for a water supply system.

They are said to be dependable pumps and capable of continuous duty. Both are centrifugal affairs, one a two-stage and the other a four-stage pump, that can be used singly or in series up to three units.

The capacity range is from 10 to 2,800 gallons per minute at pressures up to 200 pounds per square inch. When operated in series, a pressure of 600 pounds per square inch can be obtained. This range meets all bulk petroleum handling requirements.

The higher capacity two-stage pump weighs 4,700 pounds. Continuous duty on six- and eight-inch Army pipelines was the primary requisite in its design. When operated on overland pipelines, capacities are 500 to 900 gallons per minute, with 20-mile station spacing over level ground.

Threadless shafts and horizontally split casings give increased dependability and simplification of maintenance.

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FUEL FOR FRONT LINES—Centrifugal pumps, for army pipelines, gasoline engine driven, will provide forward combat areas with liquid fuel.

MEDICINE

Dicumarol Prevents Dangerous Blood Clotting

➤ USE of a drug that prevents the blood from clotting so readily gives promise of being a good routine way of keeping heart patients, suffering from rheumatic heart disease and auricular fibrillation, from attacks of dangerous blood-clots or emboli.

Dicumarol is the drug that was used for this purpose in 18 patients by Dr. Stuart W. Cosgriff of College of Physicians and Surgeons of Columbia University and Presbyterian Hospital, New York, who reports in the *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* (July 8).

Continuous dicumarol anti-coagulant therapy was used for as long as two years in some patients. This seemed to prevent recurrent attacks of the blood-clot difficulty.

Dr. Cosgriff believes that this treatment could be applied to those suffering from arteriosclerosis as well.

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AGRICULTURE

World Sweet Tooth: Record Sugar Production

➤ THE world's tooth is growing sweeter. A new all-time record of world sugar production is in the offing, reports the U. S. Department of Agriculture's Office of Foreign Agricultural Relations. Expected output for the 1949-50 growing season is 37,999,000 tons, two percent more than last year's record crop.

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ENTOMOLOGY

A Beetle, a Bad Little Bug, Produces Russian Bellows

➤ THE cold war is obsolete. Now it is the bad bug war. A squat, zebra-striped little beetle is producing bellows from behind the Iron Curtain.

On June 30 Russia handed the U. S. ambassador in Moscow a formal charge that American planes have been dropping Colorado potato beetles over Eastern Germany.

The State Department replied that Russia's charge was "one of the most fantastic fabrications that has ever been invented by one government against another." Russia is trying to cover up its own failure to control the ravenous, destructive potato pest, the U. S. said in blunt terms.

There is little doubt that the potato beetle emigrated from this country to Europe—but it made the voyage in 1918, traveling with the A. E. F. in World War I.

By 1924 it was a serious enemy in French potato fields, and stood at the Rhine with its feelers toward Germany. By 1939, the Germans had been at war with the striped

potato beetle for years. Hitler was the first to scream at the Allies, "Stop dropping potato bugs," the U. S. pointed out to Russia.

Actually, if this country were so minded, it could get into the bug propaganda business itself, with as little justification as the Soviets.

The codling moth that eats our apples came from southeastern Europe. From across the Atlantic came the gipsy moth, and the ox warbles which attack steer hides. We pick up a \$350,000,000 bill for damages each year because of the European corn borer. The boll weevil, ruinous cotton pest, came from Mexico. We have a tenacious parasite called the Japanese beetle.

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MEDICINE

Female Sex Hormone Relieves Advanced Cancer

➤ A NEW method of using female sex hormone to relieve men and women patients with far-advanced cancers was reported by Dr. Roy Hertz of the U. S. National Cancer Institute and George Washington University Cancer Research Service, Washington, D. C., at the meeting of the American Medical Association in San Francisco.

"Significant" results in five prostate cancer patients and five breast cancer patients have been obtained. In the prostate cancer patients these good results included a rapid reduction in the size of the cancer, relief of severe bone pain, and general improvement in weight, appetite and feeling of well being.

In the breast cancer patients the good results included prompt and marked shrinking of the visible breast cancer, marked suppression of the fluid in the chest, decisive relief of pain from cancer spread to bones, reduction in the size of the cancerous lymph nodes, and general rehabilitation of the patient.

The good results, Dr. Hertz and associates believe, come from the size of the dose of hormone given. A big dose in itself, however, is not enough, Dr. Hertz emphasized. The important factor is the amount of hormone that stays in the patient's blood. And the hormone disappears from the blood rather fast after an injection of even a big dose.

With this in mind, Dr. Hertz and associates worked out the new method of giving the hormone. This consists in continuous dripping of hormone solution into the veins or under the skin, using a special plastic tube for the purpose. The infusion, or continuous dripping, of hormone into the patient goes on for hours. In one patient this infusion was given continuously for 72 hours. Others have been for 12-hour periods.

The work is still in the experimental stage.

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MEDICINE

Metrazol for Sleeping Tablet Suicide Attempts

➤ IN case of attempted suicide by sleeping tablets containing barbiturates, use of metrazol (pentylene-tetrazole) in large quantities can save many lives. Drs. John R. Murphy, James Dooley and A. Warren Jones of Knickerbocker Hospital recommend in a report to the *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* (July 8).

A quadrupling of suicide attempts with barbituric acid derivatives in New York City justifies physicians being alert to use of metrazol treatment anywhere for immediate relief until the patient can be transported to a hospital, the doctors report.

More vigorous enforcement of the laws controlling distribution of the barbiturate drugs is urged by the report.

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RADIO-ASTRONOMY

Sunspot Color Filter To Aid Radio Predictions

➤ FASTER, more accurate prediction of when radio storms may upset short wave communications will come from the use of a color filter for observing sun spots now being installed at the U. S. Naval Observatory in Washington.

Short wave radio is important for both military and commercial communication. There is usually little trouble with communication between the Far East and the United States. If there is difficulty, messages can be relayed via Honolulu to San Francisco.

In the North Atlantic region, however, the huge magnetic storms kicked up by sun spots can completely black out short wave communications.

With this new solar color filter, scientists will be able to take pictures of the sun at frequent intervals or continuously if desired. They will take these pictures in the narrow band of red light radiated by incandescent hydrogen gas. All other light is eliminated by the filter.

The filter contains ammonium dihydrogen phosphate crystals that have been grown artificially. These crystals are also used in underwater sound apparatus.

The sun spots that snarl short wave radio are sometimes large enough to be seen by the naked eye. The prominences, flamelike whirlwinds of solar fire, can be seen only by the light radiated by the gases within them. The new filter accomplishes this.

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E FIELDS

PUBLIC HEALTH

Urge That India's People Eat Peanuts for Health

➤ IF INDIA'S 400,000,000 people can be taught to eat peanuts, many of the diseases which plague that country could be wiped out.

This is the conclusion of Dr. P. K. Vijayaraghavan, biochemist from India's Nutrition Research Laboratory, who is doing special protein research at the University of California at Los Angeles.

He points out that India is starved for proteins of good nutritional value because of her traditional cattle worship. While modern Indians do not today hold rigidly to the religious beliefs which defy the animals, age-old customs have made vegetarians of them.

India's protein starvation is the basic cause of many diseases which afflict her teeming millions. Indians do not get enough proteins in their diets, either in meat or vegetables. As a result, malnutrition and dietary deficiencies are widespread.

Dr. Vijayaraghavan believes it would be easier to introduce a vegetable high in protein value—such as peanuts—into the Indian diet than to try to make meat-eaters out of his countrymen. This is the line his research at U. C. L. A. is following.

At the present time, peanuts are one of India's biggest crops. However, most of the crop is fed to cattle. Dr. Vijayaraghavan is convinced that if Indians can be induced to eat peanuts instead of feeding them to cattle, a major battle in the war against malnutrition will have been won.

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METEOROLOGY

Scientists Disagree on Whether Rain Calms Sea

➤ RAIN falling upon an angry ocean either helps calm the waves or it does not. British scientists—armed with tanks of water and apparatus to make measured drops fall into the tanks—are arguing out this point and coming up with varying answers.

Latest blow in the battle of the raindrops was delivered by G. L. Sainsbury and I. C. Cheeseman of Andover, Hants. They say raindrops have little, if any, effect on waves, despite what British scientists Osborne Reynolds and C. F. Barnaby say to the contrary.

Supporting the earlier conclusions of E. W. S. Ashton and J. K. O'Sullivan of the University of Manchester, Messrs. Sainsbury and Cheeseman cite their experiments in

dropping measured particles of liquid dye from varying heights into a tank of water. They claim that the greater the height from which a drop falls, the more likely is its energy to be dissipated on the surface of the water, therefore having little effect on the wave movement.

Their opponents say drops of rain produce a vortex which goes down under the surface, thus tending to calm down the waves.

The controversy is being carried on in the letter column of the British scientific journal, *NATURE* (July 8).

Other scientists, including Americans, say that the effect of a calming of the sea when it rains is due either to a change in the direction or the lessening of the force of the wind.

Oceanographer Boyd Olson with the U. S. Navy's Hydrographic Office says he does not think experiments with laboratory tanks of water can be conclusive because in the tanks the Britishers cannot demonstrate the effect of the momentum of the waves and the velocity of the particles of water in the ocean. His conclusion is that rain, by itself, would have little effect on the waves.

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AGRICULTURE

Farms Still Need Muscle Even with Weed-Killers

➤ THE harrow and the hoe will still be necessary down on the farm, even with effective weed-killing chemicals such as 2,4-D.

Ever since 2,4-D was introduced to U. S. cornfields after World War II, there have been predictions that cultivators and other weed-control implements would soon be obsolete. Spectacular results with the new chemical, such as eliminating weeds for the entire summer with a single application in the spring, were reported from various parts of the country.

But, say researchers at Rhode Island State College, lack of cultivation may cut corn yields as much as weeds, depending upon weather conditions. Without stirring and aerating, soil can be compacted by rain and sun almost to the consistency of brick. And some weeds can come back after a 2,4-D treatment.

A series of carefully-controlled experiments using 2,4-D with and without cultivation were carried on in Kingston, R. I. In the plots which were not touched with a cultivator, yields were less than half the normal amount.

"It seems that 2,4-D by itself is not the complete answer," says Dr. Francis B. Muller. He points out that with chemical weed control, a certain amount of cultivation will still be needed, depending upon soil and weather conditions and the stubbornness of the weeds being fought.

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RADIO

Attention Radio Tinkerers: Leave Ignitron Alone

➤ HUSBANDS who blithely unscrew the back of home radio sets, boasting "I can change any tube the engineers turn out," haven't heard of the new ignitron.

An electron tube which sometimes comes four feet in height, the ignitron is now being used to supply massive bursts of electricity to power modern atom-smashers. Hooked together, these tubes can serve up split-second jolts of electricity measured in thousands of volts and amperes.

Application of the new ignitrons to million- and billion-volt atom smashers was revealed in Pasadena, Calif., at the American Institute of Electrical Engineers. General Electric engineers M. J. Mulhern, C. C. Herskind and J. E. Hudson, together with J. L. Boyer and C. R. Marcum of Westinghouse, described installations of ignitrons at the University of California Radiation Laboratory, Brookhaven National Laboratory, University of Illinois, and in other units still under construction.

The tubes are used to convert high-voltage alternating current to direct current voltages needed for the bevatron and synchrotron, new types of atom smashers. Already widely used in industry at lower voltages, these new ignitrons take the place of huge direct-current generators normally needed to rectify AC power.

Pools of mercury give the surges of needed energy in high-voltage arcs. So much heat is generated by the tubes that they must be cooled by continuously-circulating water.

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PHYSIOLOGY

Calves Carry Own Vitamin Factories

➤ YOUNG calves carry their own vitamin factories around with them, E. M. Kesler of Pennsylvania State College reported to the American Dairy Science Association meeting at Ithaca, N. Y.

Samples of partially digested feed were taken from a calf's stomach. More thiamine, riboflavin and nicotinic acid (B-complex vitamins) were found than had originally been contained in the feed.

The exact mechanism by which the young calf turns out vitamins needed for better health is not yet known, Mr. Kesler indicated.

Calves inoculated with extracts from the cud of older cows were found to digest more food. These experiments were described by Drs. H. R. Conrad, J. W. Hibbs and T. S. Sutton of Ohio State University. Presumably, the scientists said, bacteria found in the stomachs of mature cattle are not present in young calves.

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CHEMISTRY

Food Gets Super Taste Appeal

Chemical which has no taste of its own, stimulates mouth watering and brings out flavors. It was Oriental cooking secret.

➤ A PILL that will be just as nutritious as a steak dinner, or even more so, will still have a tough battle replacing a good, old-fashioned meal with its stimulating aroma and delightful taste.

For we judge food by its flavor, and pills even though nutritious, are not likely to have the flavor of a steak smothered in mushrooms.

One of the newest chemical substances that will perk up, or enhance, food flavor is MSG. This is an abbreviation for monosodium glutamate. Now sold as pure white crystals, the chemical was known in a crude form by Orientals for centuries.

MSG is a natural protein product that can be made from vegetables or grain. It has no flavor of its own in the way that salt and pepper, for instance, do. But it does intensify the flavors already in food as well as bring out flavors that might otherwise remain hidden.

At one time gourmets in the United States could buy it under the name of "aji-no-moto." While its use in Chinese food and in canned and dehydrated soups is fairly well known, its possibilities in the preparation of home-cooked foods are not so familiar.

Increases Saliva Secretion

MSG not only increases the secretion of saliva for some time, but also stimulates a tingling feeling in the mouth. To some, it has no taste at all. Even to most of these people, however, MSG does perk up the taste of foods to which it is added.

Because earlier preparations of monosodium glutamate, with a relatively low degree of purity, exhibited a meatlike flavor, the general belief existed that glutamate should be used as a seasoning for imparting meat flavors.

Continued refinement in production methods has been responsible for progressive increases in purity. Most of the MSG products available on the market today are over 99% pure. Only when the pure product became available was its unique property of accentuating natural food flavors fully appreciated.

Glutamic Acid in Vegetables

To determine whether vegetables contained free glutamic acid, 16 varieties of canned vegetables of recognized brands and six kinds of fresh vegetables were

analyzed. They found that all contained glutamic acid, with mushrooms, peas and corn ranking highest. Fresh peas and fresh young sweet corn contained even more glutamic acid than older samples from the same field.

Meats, poultry and seafood analyzed revealed the presence of glutamic acid, also. Studies were made of chicken, seafoods such as salmon, tuna and clams, and meats such as roast beef, and meat products such as sausages.

Hominy, one of the vegetables studied, turned up without any glutamic acid. But researchers pointed out that hominy is made from mature corn which has less glutamic acid than young corn, and they said, the small amount of the acid which may have been in the corn might well have been washed out during the hominy process.

Cooked vegetables stored in the refrigerator kept most of their glutamic acid. Stored raw vegetables lost from 25 to 35% of their glutamic acid, most of it in the first 24 hours of storage.

As a result of these studies, it was thought that part of the superior flavor of young and freshly harvested vegetables may be due to their higher glutamic acid content. Also the glutamic acid in meats contributes

to their natural flavor.

Undesirable Flavors Suppressed

The flavor-enhancing properties of MSG are retained indefinitely regardless of the length of time the food with which it is used may be stored.

On the other hand, undesirable flavors in certain foods are suppressed by monosodium glutamate. Such unwanted flavors include the sharpness of onions, the rawness in many vegetables and some meats, and the flavor of peel and earthiness in other vegetables, such as potatoes.

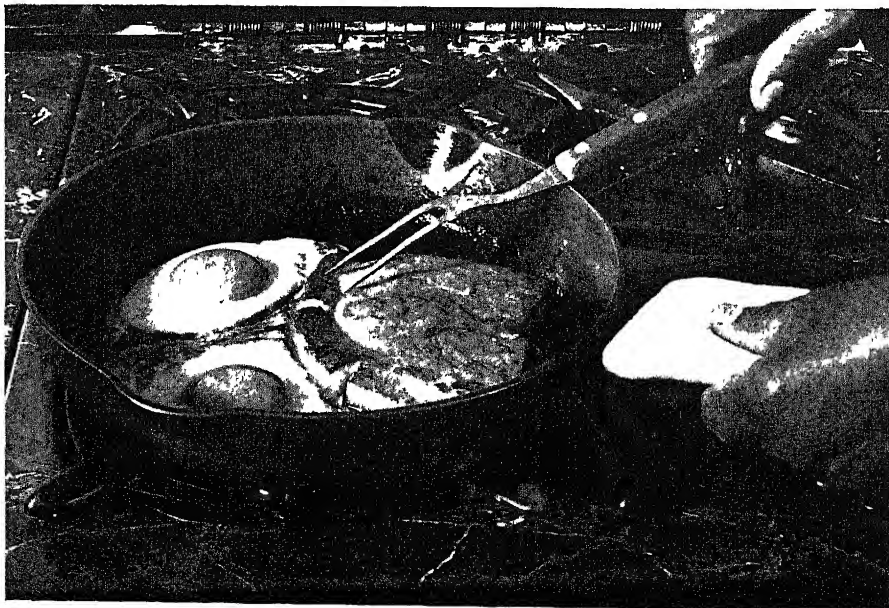
Found in Proteins

Glutamic acid is one of the most common of the amino acids, being one of those found in practically all proteins. Wheat gluten is one of the richest and probably the most economical source of this amino acid. The proteins in wheat gluten contain approximately 40% glutamic acid.

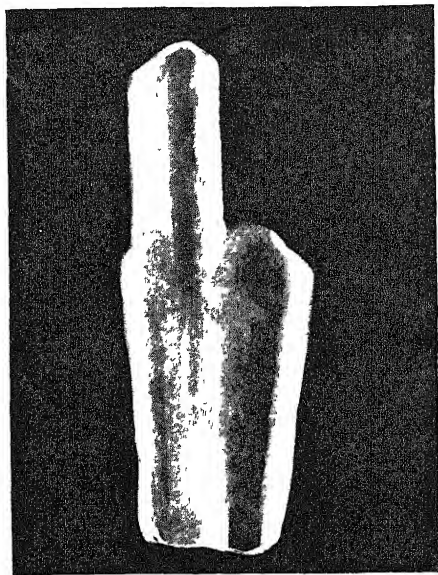
In one of the commercial methods for preparing MSG from wheat gluten, the protein is completely digested by boiling or autoclaving with strong hydrochloric acid. After filtering and adjusting the amount of acidity, glutamic acid crystallizes in long, white needles.

Commercial Preparation

These crystals are then filtered off, purified and neutralized by dissolving in a solution of soda. This solution is then concentrated and allowed to crystallize over



ENHANCES FLAVORS—Added to almost any kind of food, monosodium glutamate perks up the taste, bringing out flavors that might otherwise remain hidden. Here it is tried on ham and eggs.



MAGIC CRYSTAL—From such protein-yielding sources as wheat spikes come the monosodium glutamate crystals which serve as the cook's fairy wand. The taste enhancing crystal is more than 99% pure.

a period of five to six days. The crystals of monosodium glutamate are then spray-washed and dried, after which they are ready for packaging.

The best flavor in food is one which appeals simultaneously to all of our flavor-detecting senses, i.e., odor, taste and feeling. An aroma is needed to make known the presence of the food, taste to entertain the tongue, and finally a pleasant combination of texture and tang to make us feel that the food is at its best in all ways.

If any of these sensory elements is missing the food is flat and uninteresting. It is the function of taste enhancers to supply the missing element or to heighten the effect of the elements already present. Monosodium glutamate does just this, yet does not have any taste itself.

To obtain for yourself a sample of monosodium glutamate as well as a new sweetening agent, sodium sucaryl, just introduced on the market and samples of other seasonings, write for the Taste Enhancers Unit of THINGS of science. Send 50 cents to Science Service, 1719 N Street, N.W., Washington 6, D.C. The supply of this unit is limited

Science News Letter, July 15, 1950

MEDICINE

Inferior Pancreas Main Cause of Diabetes

➤ THE main cause of diabetes is an inferior pancreas, with the inferiority of this organ being hereditary, Dr. Russell M. Wilder of the Mayo Clinic stated at the meeting of the American Medical Association in San Francisco.

"There is little evidence to support the view that stress imposed by hypophysis (pituitary gland), the adrenals or the thyroid accounts for the development of the clinical entity diabetes mellitus," Dr. Wilder said. "The normal healthy pancreas possesses a capacity which is adequate to meet demands for insulin created by all degrees of endocrine overfunction encountered clinically."

"Temporary failure occurs in many instances with resulting hyperglycemia (excess sugar in blood). However, from the fact that the diabetic state so provoked disappears when the hyperfunction of the insulin opponents is corrected, the inference is clear that the overfunction of the pancreatic beta cells has not led to their destruction. Exceptions may occur but they are most uncommon."

"On the other hand, overweight or the excessive consumption of food which leads to it, imposes a demand for insulin which not only exceeds the normal demand but is of long duration, extending usually over many years and thus may lead to beta cell destruction. However, only a small proportion of persons who are grossly overweight develop diabetes."

"Therefore, in those cases in which diabetes is provoked by overweight we can logically assume that the pancreas genetically was possessed of less capacity than normal from the outset."

"Furthermore, in very many instances of diabetes, including almost all cases of diabetes in childhood, we find no grounds for assuming the existence of a pancreatic overstrain of any kind. The causation of these cases must therefore rest entirely on inferiority, anatomic or functional, of the pancreatic beta cells. Diabetes in such persons follows stresses such as those imposed by growth, puberty, pregnancy, infectious disease, etc., the stresses to which all persons are exposed."

Dr. Wilder said the theory of a single

origin of diabetes receives support from studies of heredity in this disease.

"Diabetes behaves in heredity as if it were transmitted by a single gene (a hereditary factor which carries a transmissible character)," he said.

Science News Letter, July 15, 1950

PHYSICS

Better Hearing for Music And Lectures in Same Hall

➤ SMALL communities can now have halls that can be used either for lectures or for musical performances with good hearing for both. And this even when the seats are the hard-to-sit-on but easily moved kind.

This promise of relief from bad acoustics in community-type halls is made by Dr. Paavo Arni of the Finnish Broadcasting Company in Helsinki. He describes a simple, inexpensive arrangement to accomplish this improved hearing in the JOURNAL OF THE ACOUSTICAL SOCIETY (June 6).

As much wall space as necessary is covered with a specially built adjustable absorbing unit. The absorbing unit, when open, exposes a layer of rockwool covered with a sheet of thin perforated plywood. Behind the rockwool there is a plywood sheet. This combination of materials plus air absorbs most of the usable sound spectrum.

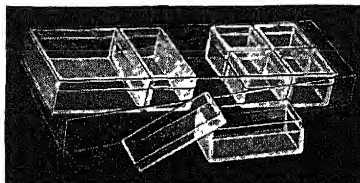
The absorbing unit can be rotated on hinges into a closed position, the absorbing surface disappearing. The reverse side of the absorbing unit, a hard glossy painted surface, is then exposed.

These units are placed one above another in two rows. The upper ones are all connected together with a steel rail; the lower ones may be individually connected to the corresponding units in the upper row. In this way all the variations of sound absorption desired may be obtained.

Science News Letter, July 15, 1950

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ENGINEERING

New Coal Mining Machine

➤ A NEW machine, now under successful development, to cut bituminous coal in the natural layers found in mines and load it on conveyors, gives promise of revolutionizing the coal mining industry.

It is known as the continuous mining machine and is a development in Huntington, W. Va., of the Mining Development Committee of Bituminous Coal Research, Inc. The committee of engineers and scientists has been at work for two years since organized March 30, 1948. It is headed by Gerald von Stroh, and its job is to develop machinery for use in mines that will lessen the cost of mining. This continuous mining machine is its initial project.

Many machines of various types and for various uses are already in use in American coal mines. Some are undercut devices to eat a channel into the face of the coal to make blasting easier. Others are powered drills using compressed air instead of the muscles of men. Still others are loaders to pick up the coal and put it on the conveyors that take it on the initial part of its trip to the surface. It is these machines, and others, that are behind the high production

rate per man per hour in American mining.

The new machine does all these things at the same time. The story of its development is included in a report issued by the responsible group. Somewhat similar machines have been developed by others and are under testing. Historically, a machine to do the same work was built and used in England for a short period about 80 years ago.

This new continuous mining machine can mine seams as low as 28 inches in thickness. It is 28 inches high, including four inches of ground clearance. Powered electrically, it employs rotors to do the cutting. Although a complicated device, with it one man can do the work which formerly required several, and safety is promoted by the elimination of explosives for blasting.

Cheaper coal should result from the use of continuous mining machines, Mr. von Stroh asserted at a recent mining meeting. If developments are maintained at the present rate, he said, cost reductions from one dollar to one and one-half dollars may be expected in the next 10 years.

Science News Letter, July 15, 1950

This new theory has been put forth by Drs. H. Alfven and N. Herlofson of Sweden's Royal Institute of Technology in a report to PHYSICAL REVIEW.

The probable sources of heavenly radio waves are relatively large regions around almost dark stars. One of the latest theories of cosmic rays, suggested by Drs. R. D. Richtmyer and Edward Teller of the University of Chicago, makes almost every star have a field that traps the cosmic radiation that it generates. The Swedish scientists now visualize the electrons from this cosmic radiation creating the radio emissions that get to earth.

The radio stars emit very little light and are situated in interstellar clouds. They cannot be seen with ordinary telescopes. Unlike visible stars, they consist of a broad region in which radiations are produced. A typical radio star might be so large that it would take light a tenth of a year to cross it.

Science News Letter, July 15, 1950

GEOLOGY

U. S. Uranium Sufficient For Tomorrow's Industry

➤ URANIUM for tomorrow's industrial atomic energy can come from present-day U. S. deposits of fertilizers and oil shales, an Atomic Energy Commission geologist said in Los Angeles, Calif.

Dr. Robert J. Wright, in a speech before the Southern California section of the American Institute of Mining and Metallurgical Engineers, confirmed recent hints that Government teams have found large, low grade uranium reserves in this country.

There are "abnormally high concentrations" of uranium in deposits such as Florida's rich phosphate beds and the Chattanooga oil shale of the east-central United States, Dr. Wright said.

The world's uranium supply now comes from high grade, comparatively small pitchblende veins and carnotite ores. "It is impossible to predict how long the high grade reserves of uranium will hold out," said the AEC geologist.

He indicated, however:

1. Recent Canadian discoveries of rich uranium ores point to increasing output there.

2. New discoveries of pitchblende have been made in U. S. mines operated for other metals, as in the abandoned Caribou silver mine in Colorado in 1945 and in Idaho's Coeur d'Alene district last summer.

3. In at least two places, the small town of Marysvale, Utah, and in Portugal, it has been shown that secondary uranium minerals on the surface were hints to rich veins of radioactive ores deep underground.

The profitable utilization of each of these potential uranium sources Dr. Wright termed "a challenging problem for industrial science."

Science News Letter, July 15, 1950

ENGINEERING

Safer Waterpower Project

➤ HUGE underground waterpower projects of the future will be virtually invulnerable to bombing, perhaps even to atomic attack, a U. S. engineering meeting was told in Pasadena, Calif.

It is often economically sound, even in peacetime, to build water power stations deep underground, the American Institute of Electrical Engineers heard.

Two officials of the State Power Board of Sweden, Ake Rusck and G. Westerberg, described underground hydroelectric stations already built in Sweden as the answer to power needs on rivers where high dams cannot be built.

These underground stations were built

for purely economic reasons, many of them long before World War II, the Swedish engineers pointed out. Higher water pressure was achieved, while upkeep on machinery rooms set in solid bedrock is much lower than above-ground power plants, they said.

"The safety attained thereby in time of war was a welcome extra advantage," their paper pointed out. By placing the turbo-generators and other machinery into deep rock rooms (the rock blasted out was used to fill the dams) the vital heart of the power installation was made virtually immune to air attack.

In a second paper on underground power plants, Paul E. Gisiger of Sao Paulo, Brazil, described a number of other installations already built or under construction in France, Switzerland, Italy and Sweden.

Science News Letter, July 15, 1950

PHYSICS

Radio Stars Send Signals From Sky's Depths

➤ RADIO stars (not the kind that appear on radio programs) exist in interstellar clouds and are the origin of the radio signals that are known to come from the depths of the sky.

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ENGINEERING

Petroleum War Production

➤ THE AMERICAN petroleum industry is fully prepared to meet any and all foreseeable military emergencies with which this nation may be confronted, Frank M. Porter, president of the American Petroleum Institute, declared at a meeting recently. Domestic production can easily be increased some 20%, he said.

Domestic production of fuel oils can be stepped up immediately to over 6,000,000 barrels a day, he stated. This increase can be made without injury to the producing formations. The average daily production

from fields in the United States was 4,921,000 barrels through the first quarter of the present year.

Since termination of World War II, American interests have developed tremendous new petroleum reserves in Canada, South America and the Middle East. Petroleum for these would be available provided they are given proper military protection. Even without them, enough petroleum can be produced to meet both military and essential civilian uses, he predicted.

Science News Letter, July 15, 1950

ENGINEERING

Estonia's Oil Shale

➤ FACTS about the oil shale industry of Estonia, now behind the Iron Curtain, are revealed in a publication by the Engineering Experiment Station of Ohio State University. Liquid fuels from Estonian shale play an important part in Soviet programs.

The facts were gathered by Prof. O. Krumin, of the station staff, from scattered papers published in various languages, information from the Estonian Bureau of Mines, the U. S. Bureau of Mines, and many other sources. The facts are interpreted by him in light of visits to the mines in 1939 and 1940. The publication is pronounced unofficially by Dr. Simon Klosky, of the Bureau of Mines and an authority on European oil shale, to be of special value at the present time.

Russia has many known deposits of petroleum but their development has lagged as far as is known. Russia has also plentiful supplies of oil shale, distributed widely, according to Dr. Klosky. But the Estonian supply is probably the largest and most highly developed oil shale area under Soviet control today.

Estonian oil shale, Prof. Krumin states in his report, is called "kukersite" after the village where it was discovered. Information about it dates back more than 150 years. The Russian government, during World War I, took steps for its commercial utilization with only minor success. During the German occupation in the World War II era, output was increased considerably and aided Hitler in his campaigns. However, the actual industrial research, the mining of the shale and the production of oil on an industrial scale began after World War I when Estonia was an independent state.

The productive area of the Estonian oil shales is approximately 75 miles long and 18 miles wide. Most of the mining is underground work at a depth of about 60 feet. German estimates, made during World War II, set a figure of 5,000,000,000 tons of

oil shale reserves, enough to supply the peacetime needs of what was then Germany for 300 years.

A particularly important fact about Estonian oil shale is that it is said to contain recoverable uranium, number one essential in atomic energy. If so, then the large quantities of spent shale dumped around

the Estonia oil shale plants will become a valuable and easily available source for extraction of uranium, Prof. Krumin declares.

Science News Letter, July 15, 1950

PHYSICS

Test Aerial Camera With Moving-Eye Lens

➤ A MOVING lens for aerial cameras which follows the landscape just as the eye does is being tried out by the Air Materiel Command at Wright Field in Dayton, Ohio. If it works it might well cut down on the bulkiness of many of the newer cameras used in aerial photography.

In the newly designed camera, during each exposure the lens moves across the focal plane shutter at the speed at which the ground is passing by under the plane. Compensation is effective up to 500 miles per hour and at ranges as close as 150 feet. The camera is expected to be most effective for side oblique photography at low altitudes and under poor light.

The moving lens, if it works out, would allow for longer time exposures and thus would permit doing away with the complicated and bulky equipment necessary for extremely short exposures.

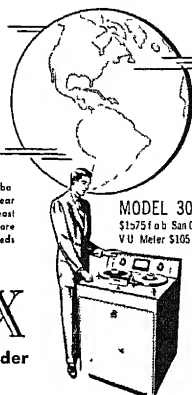
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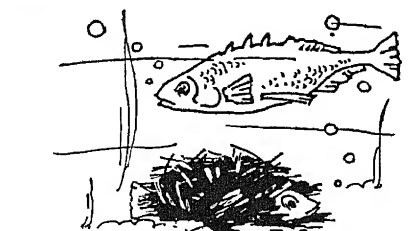
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ZOOLOGY

NATURE
RAMBLINGS

➤ **STICKLEBACKS** are small fish with sharp spines sticking up on the back. These spines vary in number from two or four to nine, depending on the species.

The stickles bristling from the fishes' backs have a distinctly thorny and beligerent appearance. This is not a deception, since sticklebacks are not at all backward in using the spines as deadly weapons, especially during the breeding season.

This takes place during the spring and early summer. At this time the males take on bright nuptial colors with which to be-dazzle their future mates.

Full of confidence in the magnetism of his new courting colors, the male first sets to work building a home. Properly speaking, it is not a home but a love nest, for it is destined to be no more than the transitory hideaway where a stickleback brings to fruition his midsummer madness.

Transitory or no, the male builds the nest with extreme care. Bits of roots and stems of aquatic plants are his building blocks, and for mortar he uses a sticky substance secreted in his kidneys which he wipes off by swimming against the part to be cemented.

The nest so constructed is barrel- or muff-shaped. The fish constantly tests the strength of his structure, butting against it here and there, reinforcing any section that dissatisfies him. To secure the nest he scoops up sand in his mouth and scatters it about the floor of the nest.

When the nest is finally just the way he wants it, possibly after as much as several days' steady work, the stickleback goes in search of a mate. When he finds one, he leads her to his nest and then either gently coaxes or rudely pushes her inside. There she lays her eggs and swims off, and the male promptly fertilizes them.

And then with the same singlemindedness that has characterized all his actions up to now, off he goes to find another mate, to repeat the cycle again, and again, and possibly still again, until there are enough eggs to satisfy his yearnings for parenthood.

From then on until the small fry are

big enough to fend for themselves, Mr. Stickleback keeps an endless vigil. He circles the nest, keeping it in repair, and violently attacking any other fish, large or small, that ventures in the vicinity.

Even after the eggs hatch out, he continues the watch, keeping the tiny offspring

in the nest, warding off all dangers. It is only when the young sticklebacks have become strong swimmers and stand some chance of eluding capture that the sentinel indifferently takes leave forever of the family he strove for so ferociously.

Science News Letter, July 15, 1950

MEDICINE

Hormones for Arteries

➤ **CORTISONE** and **ACTH**, the two hormones that have brought dramatic results in arthritis, now show promise in two artery diseases, periaarteritis nodosa and cranial arteritis.

Seven patients given one or the other of these hormones all got "prompt subjective relief," Drs. Richard M. Schick, Archie H. Baggenstoss and Howard F. Polley of the Mayo Clinic reported to the American Heart Association in San Francisco, Calif.

The two diseases are inflammatory conditions of the walls of arteries. The fever which comes with this condition subsided in 24 to 72 hours after the patients were given cortisone or ACTH. Blood sedimentation rates, elevated in the disease, decreased to normal but more gradually than

the temperature.

Partial relapses occurred in five patients after the hormones were stopped. The other two are still on their first course of treatment.

Two of three patients who were critically ill died of heart and kidney failure, though they improved at first. The other has severe and progressive high blood pressure. Autopsy examination of the two who died showed complete healing of all the diseased places on the arteries, but in the process of healing, the arteries were closed by fibrous tissue formation. This caused widespread damage to internal organs deprived of their blood supply when the arteries were closed.

Science News Letter, July 15, 1950

MEDICINE

➤ **A LITTLE** known hormone has demonstrated the ability to stimulate body tissue growth without producing whiskers and other masculinizing effects in women.

The hormone, a steroid called methyl androstenediol, may prove to be widely useful in the treatment of diseases occurring in women which are accompanied by a general wasting of body tissue, such as Simmond's disease and rheumatoid arthritis.

Discovery of the growth-producing properties of the hormone was reported to the meeting in San Francisco, Calif., of the Association for the Study of Internal Secretions by three University of California Medical School physicians, Dr. Gilbert S. Gordan, Dr. Eugene Eisenberg, and Dr. Henry D. Moon.

Physicians have sought a hormone with the properties of methyl androstenediol for many years. Testosterone has been used successfully in tissue building, but its use has been limited by its undesirable side effects, particularly masculinization in women. The growth hormone, while very effective in rats, does not appear to promote growth in man in its present form.

As a step in the search by the University of California group, Dr. Eisenberg developed a test for quickly measuring the tissue-building properties of compounds. He found that the levator ani muscle is an accurate indicator of growth promotion.

This muscle is undersized in castrated animals. If a compound injected into cas-

trated animals has growth-promoting properties, the muscle increases in weight.

When castrated animals were given the hormone for as long as a week, it was found that this muscle was restored to normal or greater than normal weight. Moreover, there were no apparent sexual side effects of the hormone.

The hormone has been tried on human subjects, and preliminary results indicate that the compound has similar results in man.

Science News Letter, July 15, 1950

PHYSICS

Cosmic Rays from Sun?
Chicago Tests to Tell

➤ **EVIDENCE** that the powerful cosmic rays bombarding us from outer space do actually come from the sun may result from research.

Dr. Marcel Schein and J. J. Lord of the University of Chicago are studying how the intensities of some of these cosmic rays change during 24 hours. He finds that bombardment by heavy nuclei of low energies is much more frequent during the day than at night.

If this same finding applied to heavy nuclei of higher energies as well, the theory that cosmic rays originate from the sun would be substantiated.

Science News Letter, July 15, 1950

Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C. Ask for free publication direct from issuing organizations.

ATOMIC PHYSICS—Wolfgang Finkelburg—*McGraw-Hill*, 498 p., illus., \$6.50. Covers the whole field of nuclear, atomic, molecular and solid-state physics from the atomistic point of view. Translated from the Revised German Edition by George E. Brown.

THE EARLY DEVELOPMENT OF THE CONCEPTS OF TEMPERATURE AND HEAT The Rise and Decline of the Caloric Theory—Duane Roller—*Harvard University Press*, 106 p., illus., paper, \$1.25. Case 3 in the Harvard Case Histories in Experimental Science, which attempt to recapture the experience of those who once participated in exciting events in scientific history and thereby impart to the social science student an understanding of science.

THE GALLINAZO GROUP VIRU VALLEY, PERU—Wendell C. Bennett—*Yale University Press*, 127 p., illus., paper, \$2.00. A study of one large group of ruins in the Viru Valley representing only the Gallinazo Period, recognized as one of the most distinctive cultures which existed in the Valley.

GRAIN—FAO Distribution Division, Cereals Section—*Food and Agriculture Organization of the United Nations*, Commodity Series, Bulletin No. 18, 116 p., illus., paper, 50 cents. The 1949-50 world grain situation is reviewed. World trade tables for each of the principal grains are included.

THE GROUND SUBSTANCE OF THE MESENCHYME AND HYALURINIDASE—F. Duran-Reynals and others—*New York Academy of Sciences*, Vol. 52, Art. 7 of the Annals, 264 p., illus., paper, \$3.00. Contributions from the fields of chemistry, enzymology, histology, physiology and clinical medicine to the same problem.

HOME NURSING TEXTBOOK—Nursing Services, American Red Cross—*Blakiston*, 6th rev. ed., 225 p., illus., paper, 60 cents, (Cloth. \$1.00). This new revision of the best seller provides more detailed instructions for home nursing. Increased material on care of the elderly and selected additional references for those who wish to study further are included.

INORGANIC SYNTHESSES, Vol. III—Ludwig F. Audrieth—*McGraw-Hill*, 230 p., illus., \$3.75. Detailed procedures of preparing 53 important compounds which are in many instances not obtainable readily or directly from commercial sources.

INTERNATIONAL LABOR DIRECTORY 1950—Dominic DiGalbo, Ed.—*Claridge*, 864 p., \$25.00. A compilation of approximately 132,000 listings covering the labor movement and organizations associated with it.

LIFE HISTORIES OF NORTH AMERICAN WAGTAILS, SHRIKES, VIREOS, AND THEIR ALLIES—Arthur Cleveland Bent—*Gov't. Printing Office*, Smithsonian Institution Bulletin 197, 411 p., illus., paper, \$1.50. This is the eighteenth in a series of bulletins of the U. S. National Museum on the life histories of North American birds.

MEASURING WATER IN IRRIGATION CHANNELS WITH PARSHALL FLUMES AND SMALL WEIRS—R. L. Parshall—*Gov't. Printing Office*, U. S.

Dept. of Ag. Circular No. 843, 62 p., illus., paper, 25 cents.

MOST OFTEN NEEDED 1950 RADIO DIAGRAMS AND SERVICING INFORMATION—M. N. Beitman, Ed.—*Supreme*, 192 p., illus., paper, \$2.50. Diagrams and service material on AM and FM sets prepared with the cooperation of various radio manufacturers.

THE NUTRITIONAL IMPROVEMENT OF LIFE—Henry C. Sherman—*Columbia University Press*, 270 p., \$3.75. A presentation of the important advances made in the last half century in the four major fields of nutrition: energy foods, proteins and their amino-acids, the mineral elements and the vitamins.

A PRACTICAL SURVEY OF CHEMISTRY—Walter S. Dyer and Manfred E. Mueller—*Holt*, rev. ed., 564 p., illus., \$3.60. A nonmathematical introductory text.

PRACTICAL TELEVISION ENGINEERING—Scott Helt—*Murray Hill*, 708 p., illus., \$7.50. Tells how television transmitters and receivers work, and how they are combined in the complete television system.

PUBLIC-ADDRESS GUIDE—Guy S. Cornish—*Radcraft*, Gernback Library No. 41, 80 p., illus., paper, 75 cents. Information on operation and maintenance of public address systems for the radio service technician.

SPEAKING CAN BE EASY FOR ENGINEERS, TOO—Committee on Relations With Industry—*Engineers' Council for Professional Development*—24 p., illus., paper, 50 cents. Presenting helpful hints.

Science News Letter, July 15, 1950

ZOOLOGY

How Octopus Learns Is Clue to How Man Learns

➤ **STUDY** of how an octopus learns is providing scientists with new knowledge of what goes on in the nervous system of higher animals.

A common plan of organization can now be detected in learning systems of cephalopods and mammals, Prof. J. Z. Young of University College in London told the Royal Society in the Ferrier Lecture.

It has been difficult, Prof. Young noted, to find out just what happens in the nervous system during learning, because the process is not localized but is generalized through large masses of tissue.

Much evidence has been found to indicate that more stable learning depends on the formation of new nervous pathways by some form of growth process.

The relationships of fibers in the closely woven networks of the higher centers is constantly being changed slightly by activity. These changes alter the direction of nervous impulses.

Science News Letter, July 15, 1950

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⚙️ **SELF-STERILIZING** nylon, for use in toothbrushes, combs, teething rings and other solid objects, is impregnated with an aryl mercuric compound in the presence of nitric acid. This recently patented process makes the article in which used a long-life bacteria-killer.

Science News Letter, July 15, 1950

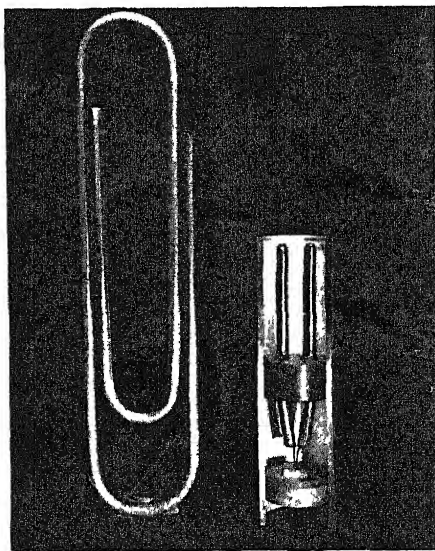
⚙️ **POWERED GRINDER** for the laboratory revolves the mortar or grinding bowl, electrically while a weighted arm holds the pestle grinder and swings it back and forth in the bowl. It handles laboratory solids faster and more efficiently than the hand mortar-and-pestle method.

Science News Letter, July 15, 1950

⚙️ **FIRE ALARM** system, for industrial installations, automatically gives a local "heat" warning if the temperature exceeds a predetermined safety point and later summons the fire department if the heat surges beyond. It is a continuous line of plastic-insulated copper tubing carrying a light electric current.

Science News Letter, July 15, 1950

⚙️ **TRANSISTOR**, a tiny metal tube shown here beside a paper clip, has the ability to amplify electrical currents in much



the same way as the electronic vacuum tubes found in all radio sets. Its secret is a crystal of the element germanium.

Science News Letter, July 15, 1950

⚙️ **FREEZE - DRYING** apparatus, which uses infra-red rays as a heat source, speeding up the process at least 10 times, was developed to produce a particular drug but

has many applications. The process consists basically of a frozen solution to be dried, a vacuum tank, and a heat source.

Science News Letter, July 15, 1950

⚙️ **FLASHER LIGHTS**, for use at night on private and executive planes, come in a complete kit for easy installation and meet the new governmental requirements for flashing lights during darkness. The device has only one moving part, and operates on 12- or 24-volt electric systems.

Science News Letter, July 15, 1950

⚙️ **COTTON SEED CLEANER**, to remove trash and other foreign matter from the seed during ginning, consists of two cylinders, one within the other, the cotton to be cleaned passing between them. Jets of air, entering through openings in the outer cylinder, blast foreign material from the cotton locks.

Science News Letter, July 15, 1950

⚙️ **CEPHALOMETER** is a type of X-ray apparatus devised to make scientifically accurate "pictures" of the exterior and interior head and face. With it, scientists hope to be able to detect early, and correct, dental and facial irregularities which lead to disfiguring growths.

Science News Letter, July 15, 1950

Do You Know?

The leading cause of fatal injuries in coal mines is falling roofs.

New Zealand stands first among the nations of the world in the average age to which its population lives.

Iceland's golden plover is quiet and almost invisible on its nest in the mossy tundra but is a noisy conspicuous bird when on the wing.

True gold will not dissolve in diluted nitric acid but "fool's gold" will; the latter is iron pyrite but it looks like gold and has fooled many.

A chemical amino compound called ortho biphenyl biguanide, added to soap in the making, prevents the product from rancidity and discoloration.

Compound 1080, chemically sodium fluoroacetate, is an excellent poison for rats but can not be safely used except by experts because it is a dangerous poison to man and other animals.

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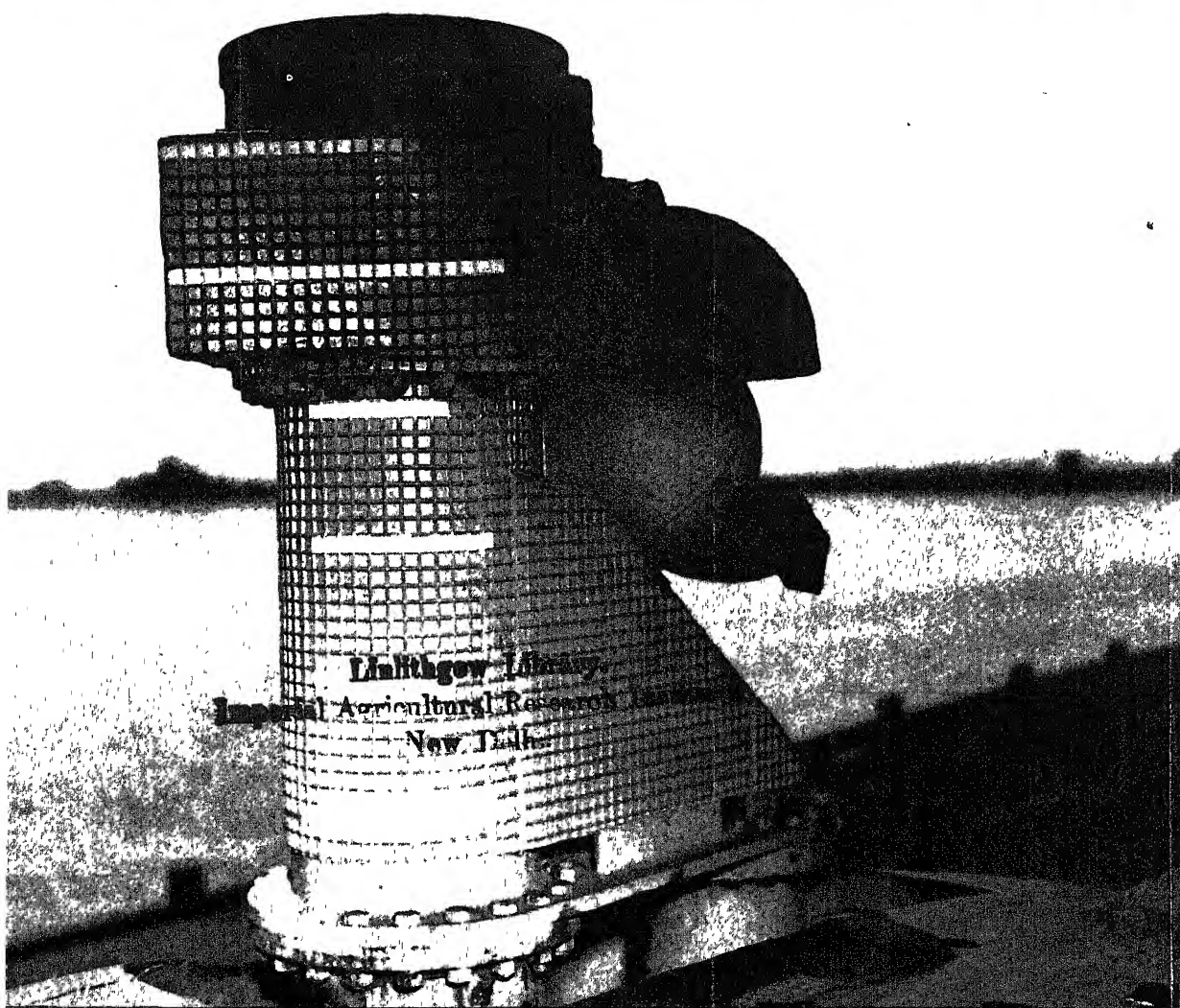
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SCIENCE NEWS LETTER

A WEEKLY SUMMARY OF CURRENT SCIENCE



Sea Breather

See Page 53

A SCIENCE SERVICE PUBLICATION

VOL. 58 NO. 4 PAGES 49-64

CHEMISTRY

Competition for the Bee

➤ A DESERT shrub and the giant Douglas fir may soon be real competitors of the busy little bee in the wax-making business.

In a converted war alcohol plant at Springfield, Oreg., wax is already being extracted from the bark of Douglas fir. The operation is a milestone. Until this spring the bee had a complete monopoly on large-scale production of true wax in this country. Douglas fir bark was being burned as waste.

Chiefly responsible for the chemical process which made Douglas fir wax a reality is a research scientist at the Oregon Forest Products Laboratory, Dr. E. F. Kurth. Using home-made 50-gallon percolating tanks and household water heaters, he proved that the bark could be made to yield a true vegetable wax. The Kurth process is now being used by the Oregon Wood Chemical Co. at Springfield, which hopes to boost production to as much as eight tons of wax daily.

Douglas fir wax was found to be harder than beeswax but not so hard as carnauba, the hardest wax known. Ranging from light tan to deep red in a semi-refined state, it has the pleasant odor of balsam.

It is extracted from the bark by hot benzene. The solvent and wax are then pumped into a second tank where the benzene is distilled off by high-temperature steam.

Very similar to Douglas fir wax is the unusual oil of a little-known desert bush called *Simmondsia*. Potentially an extremely valuable new American crop, this plant has grown wild in Arizona, southern California and Mexico for centuries. Its nut-like seeds were used by Indians as food and a medicinal oil. The plant itself is nutritious fare for cattle, goats, sheep and deer.

In 1933 two chemists discovered that *Simmondsia* oil differs radically from all other known seed oils. It was more like sperm oil from whales. Chemically it was not a fatty oil at all, but a liquid wax.

Treated in the same way that modern shortening is made from cottonseed oil, *Simmondsia* oil becomes a very hard white wax, nearly as hard as carnauba. Untreated, it has qualities which give it great commercial promise. It does not become rancid as do ordinary vegetable oils. It can be used under high temperatures as a lubricant for high-speed machinery.

"Present market possibilities for *Simmondsia* oil would seem unlimited," N. T. Miróv, scientist at the California Forest and Range Experiment Station, writes in the journal *CHEMURGIC DIGEST*.

The oil can be used in the manufacture of rubber, chewing gum and linoleum, he says. The hydrogenated wax makes a good polishing wax, and can be used wherever wax is employed in modern industry.

The future of *Simmondsia* lies in taming it, the chemist points out. It is extremely difficult to collect the seeds from the wild bushes. But they can be cultivated successfully. A plantation of *Simmondsia* near Riverside, Calif., has flourished during the past six years, giving bigger seeds and more of them than do the bushes growing wild.

Science News Letter, July 22, 1950

MILITARY SCIENCE

No Worthwhile Target For A-Bomb in North Korea

➤ THE A-bomb almost certainly will not be used on North Korea. There is no target in the Communist-dominated territory large enough to warrant use of such an expensive and devastating weapon.

The "crude" A-bombs used at Hiroshima and Nagasaki obliterated areas of about 10 square miles. Largest city in North Korea is its capital, Pyongyang and, according to the South Korean Embassy in Washington, D. C., Pyongyang is a city of five square miles containing 600,000 people.

Second largest city in North Korea is Hamhung, up near the Russian border, with 300,000 inhabitants and four square miles of territory.

The next two largest cities, the Korean embassy spokesman says, are Haeju, on the western side of the peninsula near the 38th parallel, and Wonsan, a port city across the peninsula, also just north of the vital parallel. Both have between 100,000 and 125,000 populations and between three and four square miles of territory.

It is not necessary to devastate an entire city and scorch some of the surrounding countryside—as an A-bomb would do in any North Korean city—to render it useless militarily. Pyongyang and Hamhung both have been developed industrially and both are railroad centers. But old-fashioned bombs, used properly, could take care of the factories and the railroad yards.

Science News Letter, July 22, 1950

GENERAL SCIENCE

Eight Million Men Of Draft Age

➤ OVER 8,000,000 young men are in the age groups affected by the draft order issued recently.

According to latest Census Bureau estimates as of 1950 there are 8,189,000 males in the ages of 19 through 25. Those in the upper part of this age bracket number somewhat more than those of the earlier ages. That is because the death rate of such young men is insignificant as compared

with fluctuations in birth rate. The birth rate 19 years ago was lower than it was 25 years ago.

Here are the figures for each age group: 19, 1,121,000; 20, 1,350,000; 21, 1,158,000; 22, 1,183,000; 23, 1,197,000; 24, 1,195,000; 25, 1,200,000.

A fairly large proportion of men drafted would be taken from their studies in school and college. In the age group 20 to 24, 827,000 are enrolled in school or college and of these 300,000 are not veterans. In the older age groups 25 to 29, a larger proportion of those in college are veterans since few men of that age are still in college unless their studies were interrupted by the last war. In this age group the enrollment is 23,000 non-veterans and 363,000 veterans.

In the age group 18 to 19 (the Census Bureau does not have estimates for the nineteen-year-olds alone) 593,000 are enrolled in school or college and of these 589,000 are non-veterans, only 4,000 veterans. These figures are as of October, 1949.

The drafting of men 19 to 25 will have a considerable effect on those employed in production, including professional and semi-professional workers.

A year ago there was a total of 6,525,000 men in the ages 19 to 25 and of these 2,376,000 were non-veterans. Of the non-veterans, 2.9% were professional or semi-professional workers.

Science News Letter, July 22, 1950

BOTANY

Membrane of Tiny Plant Cells Found to be Porous

➤ TINY plant cells are equipped with an even tinier network that carries materials between their nuclei and the surrounding cytoplasm.

This network might be compared to a railroad system which carries freight from a large city to and from the surrounding countryside.

Dr. Flora Murray Scott, professor of botany at the University of California at Los Angeles, reported the existence of the system to the International Botanical Congress in Stockholm.

Prior to her discovery, the membrane which encloses the nucleus was not known to be permeable. Scientists were puzzled over the manner of exchange between the nucleus and the cytoplasm. Her research is the first demonstration as to how the exchange may take place.

The plant cell network is made up of "fibrillae" or slender strands which traverse the membrane of the nucleus. In many plant cells, this network is barely visible under highest-powered microscopes.

In her research, however, the U.C.L.A. botanist used the giant nuclei of wild cucumbers, in which the strands are easily seen under the microscope.

Science News Letter, July 22, 1950

ENTOMOLOGY

Nerve Gases Vs. Insects

The only defense against parathion is a gas mask. This insect killer belongs to a family of chemicals commonly known as the nerve gases.

➤ WITH parathion, an insect killer now being used on U S fields and orchards, men on the big spray rigs have only two choices: Wear a gas mask or die.

There is good reason for the bold-face, urgent warning carried on each drum of this compound and of other new chemicals widely available to American farmers.

For while military authorities have kept "Top Secret" stamped across a weapon developed by Germany in World War II, that same weapon has been in use in this country for at least two years against insect pests. The weapon is a family of chemicals with an ominous nickname—the nerve gases.

Some of the effects of parathion on warm-blooded animals, and that includes man, were described recently by witnesses at a Food and Drug Administration hearing.

Now in their seventh month, the hearings are part of an extensive study by the Food and Drug Administration of crop control chemicals used on today's truck farms and orchards.

Since January, more than 5,000 pages of testimony and over 1,000 exhibits have been presented. All of the early testimony was limited to proving one already well-established premise. Chemicals are vital to modern farming, without them, fruit and vegetable growers would fight a losing battle.

The most important question, however—how toxic are these chemicals to man—is now being covered with testimony on such potent insecticides, weed killers, and fungicides as parathion.

Inhale too much parathion or absorb too much through your skin. In quick succession your muscles begin to twitch, you find it hard to breathe, your nose and mouth begin to water. Then come gasping, diarrhea, convulsions, unconsciousness and death.

This has happened to more than a dozen farm workers and chemical packers in the last two years, Dr. John P. Frawley of the Food and Drug Administration told Science Service. Seven men died last year from parathion poisoning. Several have already died this farming season.

Even more toxic than parathion are two other insecticides still to be taken up in the protracted Federal hearings on allowable residues of chemicals used on U. S. fruits and vegetables. These are TEPP and HETP, or in full chemical designation, tetraethyl pyrophosphate and hexaethyl tetraphosphate.

Gas masks are essential in handling

these chemicals, members of a deadly family called the organic phosphates. Rubber gloves, boots, hat and raincoat are advised, for the poisons can be absorbed easily through the skin.

Why use these dangerous substances at all? Because they are among the most effective insecticides yet developed. Fruits and vegetables on which parathion can be used to cut down insect losses include apples, pears, plums, peaches, beans, beets, cabbage, carrots, corn, onions, peas, potatoes and tomatoes.

Parathion kills mites, moths, aphids, the Mexican bean beetle, armyworm, corn borer, corn earworm, thrips, Colorado potato beetle, red spider, grasshoppers and the Japanese beetle.

MEDICINE

Mechanical Kidney

➤ MODERN machines that save lives instead of destroying them are the mechanical, or artificial, kidneys now being made in several styles. The artificial kidney takes over when the patient's own kidneys stop functioning temporarily.

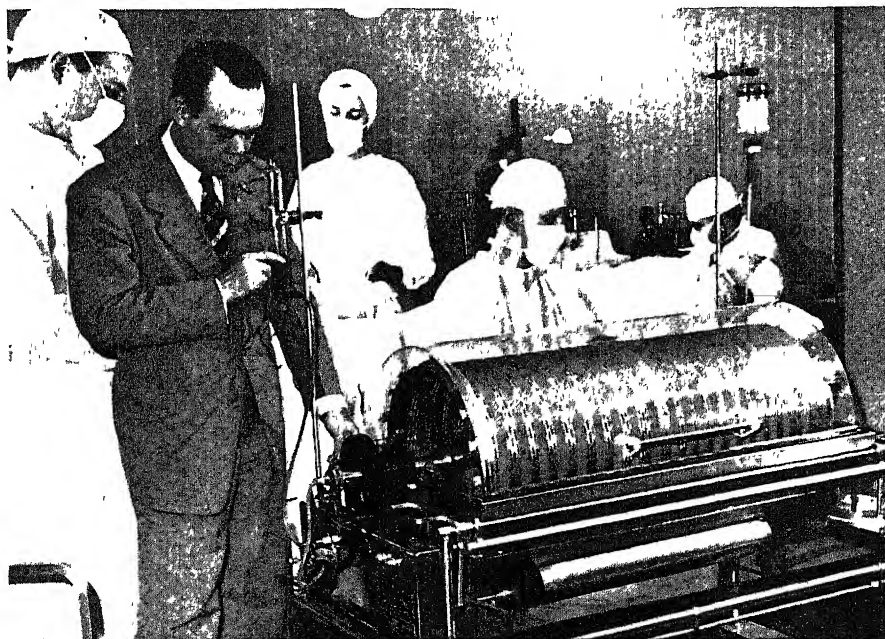
Only in extremely heavy doses would parathion residue on fruits and vegetables reaching market prove dangerous to consumers, experts from the Food and Drug Administration and industrial laboratories testified at the legal tolerance hearings.

Dr. Frawley said long-term Government experiments showed that two-tenths of a milligram of parathion per thousand grams of a rat's body weight produced no ill effects. In man, he said, one-fourth of that amount or about 3.5 milligrams for a 150-pound human being would be well within all safety limits.

Dr. Clinton H. Thienes, head of the department of pharmacology at the University of Southern California School of Medicine, had a higher estimate. Man can take 50 milligrams (about 2/1000 of an ounce) of parathion in a day without suffering any adverse effects, he said.

Object of the Food and Drug Administration hearings is to round up such basic data as this for a new set of Federal regulations. The regulations will set the permissible amount of chemical residue on fruits and vegetables to be sold in interstate commerce.

Science News Letter, July 22, 1950



STAND-IN FOR KIDNEY—Blood from the patient's arm runs through the cellophane tubing wound around the drum. Used by patients suffering from uremia and pregnancy complications, it also helps those less acutely ill.

had the idea that if the blood could be dialyzed through a fine-pored membrane which would sieve out the waste products, it could then be returned to the body and the patient might survive. They tried this on animals, but had difficulty in keeping the blood from clotting while it was out of the body.

Discovery and development of heparin as an effective anti-blood clotting agent and of cellophane membranes, made possible the construction of practical artificial kidneys for human use.

Blood from the patient's arm is run through cellophane tubing wound around a big drum. The drum revolves in a bath of special salt solution. After its bath, the blood is returned to the patient's body through another vein.

At the same time that the impurities are being removed from the blood, beneficial chemicals can be put into it from the fluid in the bath, the chemicals being selected in accordance with the particular patient's needs. Heparin keeps the blood from clotting and the temperature can be kept the same as that of the body.

Dr. W. J. Kolff pioneered the development of this type of artificial kidney during the war at the Municipal Hospital at Kampen, Holland. After the war he came to this country and is now a staff member of the Cleveland Clinic, Cleveland, Ohio.

The artificial kidney shown in the picture is a Kolff type, but other styles have been devised. One of these uses flat cellophane sheets between longitudinally corrugated plates.

Patients with acute uremia in kidney disease, in the pregnancy complication, eclampsia, in shock conditions and in some types of poisoning, may be saved by the artificial kidney which keeps them alive while their own kidneys are recovering from the acute condition.

But other, less acutely ill patients may

also be helped by this machine. And the apparatus may prove important for research leading to new knowledge of body processes.

Science News Letter, July 22, 1950

ASTRONOMY

Unseen Distant Galaxy May Prove Relativity Theory

➤ A SLIGHTLY fuzzy object surrounded by an almost-perfect halo has been discovered in the constellation Serpens by Arthur Hoag, of Harvard College Observatory.

He proposed to the American Astronomical Society in Bloomington, Ind., that in lieu of other explanation it may be a "gravitational lens," caused by the curvature of space around the large total mass of a galaxy of stars.

According to Einstein's theory of relativity, light will be deviated in the vicinity of massive bodies, and at eclipses of the sun it has been found that such deviation is observable in the light of stars passing near the sun. If a very distant galaxy of millions of stars happens to lie exactly along the line of our sight to an even more distant similar galaxy, the gravitational action of the first galaxy could conceivably cause the light of the second to be curved around it on all sides. Thus, although we could not see the one galaxy behind the other, its light would reach us as a "halo" around the nearer object.

The new object, found on a Schmidt camera photograph of 75 minutes exposure at Harvard Observatory, is of the 17th magnitude, and it has an almost perfect halo around it, 17 seconds of arc in radius. At first, this might appear to be one of the so-called planetary nebulae, which are rings of gas surrounding hot blue stars. The color of the nucleus of the new object is red, however, and the spectrum of the

halo is continuous, not consisting of bright emission lines as it would if it were a planetary nebula.

The object is far from the plane of the Milky Way, where no planetaries have been observed, but where galaxies abound. Its nucleus is fuzzy, not starlike, and its appearance without the halo would cause it to be classified as a galaxy of the spheroidal type, with a total mass equal to that of 800 thousand million suns.

Science News Letter, July 22, 1950

SCIENCE NEWS LETTER

VOL. 58 JULY 22, 1950 No. 4

45,200 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W. Washington 6, D. C., North 2255 Edited by WATSON DAVIS

Subscription rates: 1 yr., \$5.50, 2 yrs., \$10.00, 3 yrs., \$14.50, single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STATE 4439

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Question Box

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What "fish food" may we be eating in the future? p. 54.

ZOOLOGY

What animal fasts for posterity? p. 62.

Photographs: Cover, Department of Defense; p. 53, Hamilton-Wright; p. 55, New York Zoological Society.

GENERAL SCIENCE

Russia may have up to 100 submarines in her Far Eastern bases. The submarine now has a decided advantage over any known method against it.

See Front Cover

➤ DEADLY, modern Russian submarines, operating from bases in Siberia and possibly Red China, are an ominous threat to our forces in Korea. At the end of World War II, the pendulum swung once more, giving the submarine a decided advantage over methods of defense against it.

Allied forces in World War II, through intensive application of science and great effort, were able finally to control the Nazi subs. But the late-in-the-war development by Germany of the snorkel breathing device, the long range torpedo and sub which could move faster underwater than the majority of their prey, have once more swung the balance so that the situation for transports and surface naval units in and around Korea is serious. Russia grabbed off many models of these modern subs and took into custody many German submarine engineers at the end of the war.

As Dr. Vannevar Bush, who directed our scientific effort in World War II, put it in a recent book: "If we entered a war soon, against a technically and industrially strong enemy, and if that enemy could effectively apply modern devices at sea, we should have the whole job of overcoming the submarine to do over again on a new and unattractive basis.

"Again we should face the severe threat that a nearly immune submarine fleet might determine the outcome of the war in favor of the enemy. Many of the successful methods of the last war are now obsolete against the truly modern submarine. There is no cure-all."

Russia may have anywhere up to 100 submarines in her Far East bases, many of them now equipped with snorkels and the latest type of speedy underwater engines.

The modern submarine's snorkel is the device that supplies fresh air to engines and crew, thus enabling submarines to remain submerged for almost indefinite periods. The snorkel's nose is shown on this week's cover of SCIENCE NEWS LETTER. Only top-most part of snorkel projects above the water.

Just as Russia has given the North Koreans tanks and planes, so she could turn over to the North Korean "navy" her Far Eastern submarine fleet. As United Nations troops and materiel are built up in South Korea, it would become a greater temptation to Russia to try to cut our sea supply lanes with submarines.

There are all sorts of gadgets for use in defense against submarines. Sonar sends out high frequency sound waves which come back as echoes when bounced off a sub. Sono-buoys work on the same principle and can be strewn over wide areas to give anti-sub ships and planes warning of the whereabouts of enemy undersea craft.

But sonar is relatively useless against a modern sub equipped with torpedoes with a range greater than sonar's range. And sono-buoys cannot cover the immensely greater areas over which a snorkel-equipped sub can roam today.

The best defense against submarines is to attack their bases. Russia has a large naval base at Petropavlovsk, on Kamchatka pen-

insula, facing the open Pacific to the north of Japan. Another base is at Vladivostok, only a few miles from the North Korean border. And there are other bases on the mainland coasts of the Seas of Japan and Okhotsk.

But this method of defense is barred so long as we are not at war with Russia and if the submarines are dubbed "North Korean."

Since the end of the war, when we realized that the submarine once again had the potential advantage, scientists and naval experts have been working hard to overcome that advantage. But peacetime progress has been relatively slow and hampered by interservice and intraservice arguments.

The war against the submarine today is more than ever a war of science, of developing new devices which will hunt out the lurking sub, new weapons and explosives which will hit and penetrate the attacking sub. Whether that war has yet been won, on paper, of course we do not know. Knowledge of the post-war development of the Russian submarine service and a glance at United States naval budgets make it reasonably certain the battle has not been won in terms of ships afloat and weapons at hand.

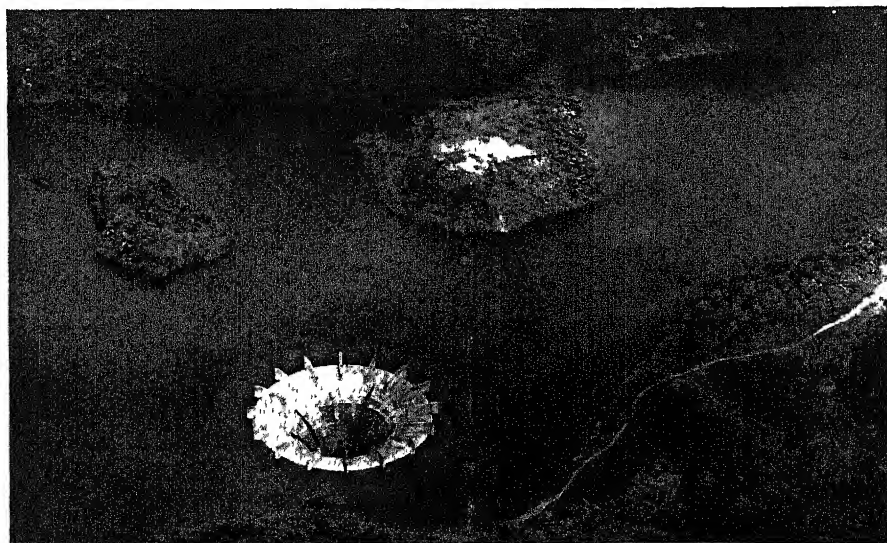
Science News Letter, July 22, 1950

CONSERVATION

➤ PUERTO RICO, Uncle Sam's Caribbean outpost, is stretching its coastline by piping water through mountains. In a \$24,000,000 project to be launched soon, the island hopes to add 35% more acreage to its irrigated lands available for agriculture.

Five reservoirs and two hydro-electric

stations will be part of a system to bring water to the wide, arid Lajas Valley in southwestern Puerto Rico. The system will utilize heavy rainfall on the northern side of the mountains, bringing the water through eight miles of tunnels into a network of irrigation canals serving 25,000 to



IRRIGATE, RECLAIM, EXPAND—A \$24,000,000 hydro-electric, irrigation and water supply project in the southwestern part of Puerto Rico will soon be launched. This is part of Puerto Rico's agricultural and industrial "comeback."

30,000 acres.

On the southern side of the mountain divide the power stations will tap flow between reservoirs to provide electricity for industrial expansion on the island.

Puerto Rico began its program of power development in 1940 to attract industry from the United States and boost employment of its own people. The huge Caonillas Dam was completed in 1948, bringing to 18 the total of the island's hydro-electric plants. These plants supply nearly all the island's power.

Science News Letter, July 22, 1950

AGRICULTURE

Vanilla May Soon Come From Cultivated Plants

► THE flavoring for vanilla ice cream may soon be coming from cultivated hybrid vanilla plants from American soil in Puerto Rico instead of from wild plants in Mexico.

The first hybrid seedlings of a vanilla plant which may resist a root-rot prevalent in Puerto Rico have been produced by Dr. Lewis Knudson, head of the Department of Botany at Cornell University, in Ithaca. Dr. Knudson worked with seeds produced at the Federal Experiment Station in Puerto Rico which wishes to establish a vanilla industry to aid the territory's economy.

The vanilla plant is an orchid. No one was able to produce the plant from seeds until the 1930's. No hybrid seedlings had ever been produced. Starting in 1938, Dr. Knudson had to work out a method of germinating the seeds for himself. No hybrid plant could have been produced without discovering a workable method of germinating the hybrid seeds.

After many years of experiments, Dr. Knudson discovered that vanilla seeds would not germinate with the use of methods for germinating other orchid seeds. He found that, in addition to keeping the seeds in the proper nutrient, they had to be maintained at higher temperatures than usual for a longer period of incubation.

Once Dr. Knudson developed his method of germination, he tried it on seeds of hybrid plants produced at the Federal Experiment Station in Puerto Rico. Four years later he succeeded in producing seedlings from hybrid seeds. This was the first time hybrid seedlings of the vanilla plant had been produced.

Science News Letter, July 22, 1950

ANATOMY-PHYSICS

Must Understand Ear to Know Why Hearing Is Lost

► IS THE human ear a microphone for the brain, sending nerve messages of all it hears to the brain? Or does the ear pick out the different sounds like a piano operating in reverse, telegraphing to the brain when each key is sounded?

Questions such as these are very impor-

tant for understanding the reason for hearing loss, report Dr. Hallowell Davis, Dr. S. R. Silverman and D. R. McAuliffe of the Central Institute for the Deaf, St. Louis. Experiments showing that the ear-brain team operates on the telegraphic system rather than the microphone system were discussed by them at the meeting of the Acoustical Society of America in State College, Pa.

A high-pitched squeak was made shorter and shorter by electronic means until the sound wave made just a few wiggles from the beginning to the end of the squeak. It then sounded like a metallic click. When the short squeaks were sent out one after the other at the same rate as the vibrations corresponding to low C on the musical scale, listeners said they heard a "buzz," or "rough metallic sound."

No listener, even when encouraged, was able to hear a low C, in spite of the fact that each click was sending a nerve message to the brain and doing so at a rate corresponding to low C.

The experimenters interpret this to mean that the brain cannot use the ear as a microphone. Instead the ear seems to separate out the different tones, and each tone is signalled separately to the brain. This explains how the sound was heard like just a lot of high pitched squeaks, making rough metallic sounds, not a low-pitched hum.

Science News Letter, July 22, 1950

ICHTHYOLOGY

Plankton, Fish Food, May Become Human Food

► PLANKTON, food of the fishes of the sea and a possible future substitute for human food, will be studied from a research ship in the Caribbean-Gulf of Mexico area, it was announced in Washington.

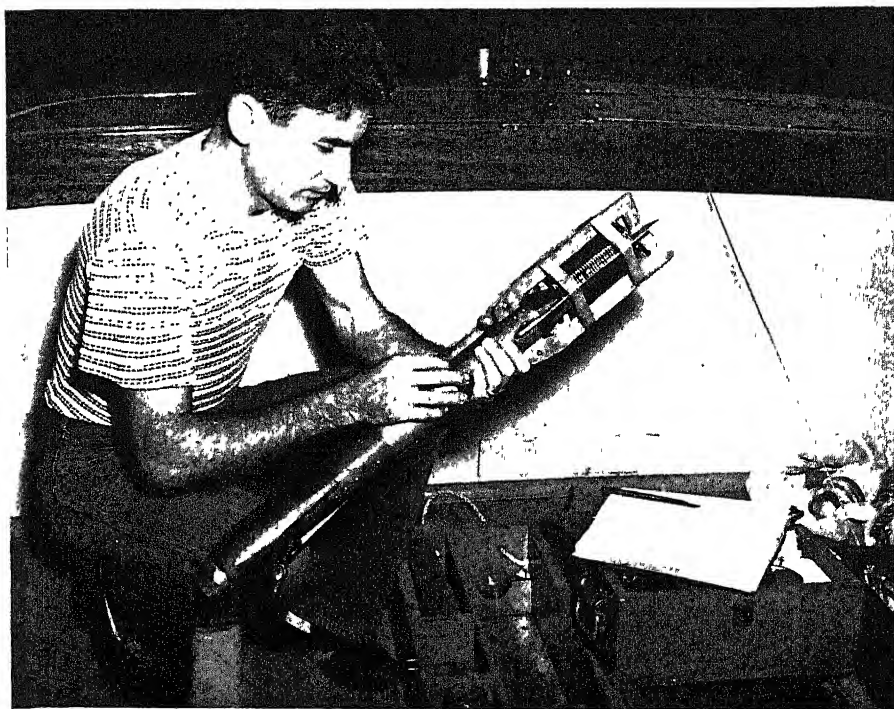
The research, sponsored jointly by the University of Miami and the National Geographic Society, will include regular samplings of the area and simultaneous observations of water and light conditions, temperatures and other factors.

Plankton are minute organisms, in both plant and animal form, which drift with the currents. The animal form, zooplankton, feeds on the plant form or phytoplankton. Sea life, from the smallest fish to species of whales, depends on these organisms for food.

The project will be headed by Dr. F. G. Walton Smith, director of the Marine Laboratory at the University of Miami. Associate director will be Dr. Hilary B. Moore, also of the University of Miami.

The scientists will try to find out how masses of plankton materialize, then relationship to fish life and their possible relationship to climate changes.

Science News Letter, July 22, 1950



IT'S A BATHYTHERMOGRAPH!—This mechanism will help to disclose some of the secrets of the ocean's drifting "meadows," populated by minute marine creatures known as plankton. Everett C. Jones, one of the research team, is shown adjusting the educated gadget, which measures ocean depth and temperature.

ENGINEERING

From Now On: Fuels

Dwindling petroleum resources necessitate development of synthetic fuels. Hydrogen from water may provide the raw material for a truly synthetic liquid fuel.

By WATSON DAVIS

Seventeenth in a series of glances forward in science.

➤ MODERN life with its automobiles, oil heat, Diesel engines and airplanes is so tied to petroleum that it is little wonder that there is a scare now and then that the earth will not be able to give forth the increasing flow of needed oil.

Actually there is little danger that the world's oil wells will not stand the strain for the next few decades, although oil from shale, synthetic petroleum from coal and even motor fuel from farm crops may come in gradually in locations where the natural oil is remote, scarce, or more costly.

The proved petroleum reserves are now larger than they were a few years ago. Proved and measured by drilling there are over 28 billion barrels of petroleum and natural gas liquids. You can not measure how long these will last by dividing this figure by the approximately two billion barrels produced annually.

For there is an excellent chance that geologists and drillers will continue to bring in new fields in unproved areas just as they have in western Texas and beneath the waters of the Gulf of Mexico in the past few years.

Even if there were no more discoveries it would take far more than 15 years to use the known reserves. The rocks underground can not be forced to accelerate their petroleum yields. There would be a gradual decline, not a sudden oil famine.

Great chemical industries are being based on the future flow of oil, such petroleum is a versatile raw material. Natural gas is more plentiful than previously imagined and it, too, can be changed into many products, including liquid fuels.

As a hedge for our future, whether it be jet-propelled or internally combusted, there is always oil shale and coal. As the Germans were forced to demonstrate by their oil shortages and as government research is confirming and improving, there is oil to be extracted from the shale rocks and synthesized from coal. In Colorado alone there are known deposits of oil shale capable of yielding 300 billion barrels of oil, over ten times the proved oil reserves.

There is almost fabulous fuel for our future, with costs, time and capital investments providing the main question marks.

For years to come, we may expect:

A. Increasing costs, longer hauls, deeper drilling and greater chemical appreciation of our natural petroleum and natural gas,

with overseas lush fields giving us a larger share of their production.

B. The beginnings of practical production of liquid fuels from oil shale, even in competition with oil from the ground.

C. The possibility that if solar energy can be captured on a large scale by "synthetic" photo-synthesis, hydrogen from water can be produced sufficiently cheaply to provide the raw material for truly synthetic liquid fuel and a whole array of chemicals.

Science News Letter, July 22, 1950

ENGINEERING

Bad TV Installations Are Fire-Lightning Hazards

➤ TELEVISION installations, unless precautions are taken, may be both a fire and a lightning hazard, the National Board of Fire Underwriters warns in a bulletin just issued. Installation suggestions are included.

High television antennas increase the possibility of damage by lightning and high winds, the bulletin states. It recommends use of approved lightning arresters. If the antenna is mounted on a metal pole or tower, pole or tower should be grounded.

Television receivers consume more current than ordinary radios, a higher voltage is used and the instruments have a greater number of heat-producing parts. They are therefore a greater fire hazard. Proper ventilation makes the danger minor. Particular care should be taken by users to see that the natural ventilation built into the receiver is not obstructed or reduced by location or blanketing.

Science News Letter, July 22, 1950

INVENTION

Carrier Safely Handles Radioactive Materials

➤ RADIOACTIVE materials will present no danger to handlers and others while enroute from U.S. Atomic Energy laboratories to research institutions if shipped in a carrier which was awarded a patent by the government.

Such carriers must be made of lead or other suitable shielding material. In this carrier the lead is encased in steel to give added strength. Its particular feature is the design which permits holding a number of radioactive slugs.

The inner part is a cylinder that can be revolved. In the cylinder are bores to hold the slugs. Each bore can be rotated under

a single opening. This assures ease and safety in loading and unloading.

Patent 2,514,909 was awarded to Gerald Strickland, Medford, N.Y., for this carrier. Rights are assigned to the U.S. Atomic Energy Commission.

Science News Letter, July 22, 1950

METEOROLOGY

Thunderstorms No Menace to Planes

➤ THUNDERSTORMS can be passed through without undue difficulty using proper aircraft and flying techniques, the Institute of the Aeronautical Sciences was told in Los Angeles by L. C. Kappil of Wright-Patterson Air Force Base, Dayton, Ohio.

He reported on "Project Thunderstorm" which originated in 1945. Field work was carried out first in Florida, where subtropical thunderstorms are encountered. Later work was done in Ohio, where frontal and prefrontal storms are found. Hundreds of flights were made through storms.

Participating agencies were the U.S. Air Force, Navy, U.S. Weather Bureau and the National Advisory Committee for Aeronautics.

Science News Letter, July 22, 1950



FORMULA FOR COOLNESS—
Looking smug about his ideas of beating the heat, the electric eel comes to the surface of the water to take a gulp of air. Since it breathes atmospheric air, the electric eel must have access to the surface two or three times a minute; eels have been drowned when they were accidentally submerged for only ten minutes. They can, however, withstand periods of 72 hours out of water, so long as their mouths are kept moist.

AERONAUTICS

New Techniques Aid Sea Rescue Work

► RESCUE work at sea, with the use of flying boats, is aided by techniques developed by Comdr Donald Bertram MacDiarmid of the U. S. Coast Guard. For his work, he was given the Octave Chanute Award in Los Angeles recently at the annual dinner of the Institute of the Aeronautical Sciences.

In order to extend the effectiveness of air rescue work at sea, Comdr. MacDiarmid made innumerable landings of a flying boat under very severe conditions. Some of these landings were made in seas as high as 18 feet and in winds up to 23 knots. He developed methods that permit flying boats to operate in seas too rough for small surface craft.

A three-camera system for low-altitude night photography brought Col. George W. Goddard of the Wright-Patterson Air Force Base, Dayton, Ohio, the Thurman H. Bane award of the Institute of the Aeronautical Sciences at the same meeting.

The three-camera system developed by him gives a vertical and two oblique pictures with moving film synchronization to compensate for ground image motion. Illumination comes from an ejected photo-flash cartridge which, by bursting at 600 feet behind and 400 feet below the photographic plane, reduces the danger of the ship's illuminating itself as an enemy target.

In a test of the system while under development, made about a year ago over New York City, a series of cartridges, each developing 50,000,000 candlepower, were ejected at intervals from a B-17 flying over the city at approximately 1,800 feet. Despite ground haze and smog, the resulting pictures compared favorably with daylight photography.

Science News Letter, July 22, 1950

ENTOMOLOGY

Mexican Fly May Restore Hawaiian Grazing Land

► A TINY Mexican fly, measuring less than a quarter of an inch with wings spread, gives promise of restoring thousands of acres of Hawaiian cattle land to useful production.

The insect, known as the stem gall fly, was brought to Hawaii in 1945 by Noel L. H. Krauss, a Territorial Board of Agriculture entomologist, as a possible means of combatting pamakani, a shrub pest which chokes large cattle raising areas in the Islands.

Before introducing the fly to Hawaii, Mr. Krauss conducted extensive tests in Mexico, where this shrub pest also flourishes, to find out whether the gall fly and other parasites which attack the shrub might also attack beneficial plants. This was deter-

mined by depriving the insects of their pamakani diet. The gall fly was deemed safe.

Propagated in the Board's laboratories, the fly was released on the islands of Maui and Oahu.

It became quickly established, but at first seemed to do little good. Then suddenly, the pamakani began to turn brown and die. Examination showed the fly planted its eggs in the stem of the shrub, from which worms developed. In an effort to defend itself, the plant built a "gall" around the worm. Most growths stopped just beyond the gall. If growth did continue, it was found the upper stem was greatly weakened and rotted.

C. E. Pemberton, Hawaiian Sugar Planters' Association entomologist, described it as "the fastest piece of plant pest control" in the Territory's long fight against such pests.

Mr. Pemberton said that before the gall fly arrived the pamakani was so thick on one Maui ranch that "it was impossible to ride through it on horseback or for cattle to get through."

"Now, there is not one pamakani plant on the whole 65,000-acre ranch that has not been affected, as far as we can determine," he said. Large areas hitherto blocked are now passable.

Much of the area is now being seeded with grass for grazing.

"If the fly continues to decimate the pamakani as in the past year, many thousands of acres will be reclaimed," Mr. Pemberton said.

The fly has now succeeded by its own efforts in crossing to the island of Lanai and is going to work on the pamakani there.

Science News Letter, July 22, 1950

NUTRITION

Even Rats Starve on Diet Of India's Hungry Poor

► AMERICAN rats soon show signs of starvation when fed on the same rice diet that is the main food of South India's hungry poor.

Trying to develop practical ways for improving the diet deficiencies of India's poor, Mrs. Rajammal P. Devadas of that country, working at Ohio State University, fed white albino rats rice diets with various supplements added. She reported to the American Home Economics Association meeting in Boston the differences in the rats' growth, food consumption and liver vitamin A when fed the various diets.

Her study showed that rice diet is mainly lacking in vitamin A, riboflavin and as yet unidentified factors present in egg yolk. Rats fed the basic rice diet grew poorly, consumed small amounts of food and developed hunched postures and roughened coats.

Science News Letter, July 22, 1950

ENTOMOLOGY

Fly's Wings Beat 212 Strokes Per Second

► A FAST fellow on the take-off is the housefly. Just how fast a fly can move when startled has been uncovered by a ballistics expert using a high-speed camera.

At the Army Chemical Center in Edgewood, Md., an unsuspecting fly landed on a target plate used in ballistics tests. Thereupon, Carl M. Herget reports in the journal SCIENCE (July 14), he fired a shot. The plate was jerked from under the fly's feet, leaving the fly out in mid-air. A camera capable of taking 2,400 pictures per second told the rest.

The fly fell about an eighth of an inch. Then, only 21 thousandths of a second after the bullet struck, its wings went into action. The target plate rebounded, turning the fly upside down, and strong air currents buffeted the tiny aviator. But through it all, the fly's wings continued beating at some 212 strokes per second.

Science News Letter, July 22, 1950

GENERAL SCIENCE

Scheduled "Wrecks" For Greater Safety

► "SCHEDULED" collisions by automobile stunt drivers are helping science to understand "unscheduled" collisions on the highway.

Herman P. Roth, physiologist of the University of California at Los Angeles' Institute of Transportation and Traffic Engineering is working with the Joie Chitwood "Daredevils" in the research.

From their experiments may come information that may be used by automobile manufacturers in providing greater safety features in passenger cars of the future.

High speed motion picture cameras and other instruments are used to record forces involved in collisions between speeding automobiles.

While the Chitwood stunt drivers are thrilling the crowds by deliberately crashing cars head-on and diving them into other vehicles, the U.C.L.A. scientists are gathering valuable information on how much of an impact a human body might be subjected to in such a collision.

"Highway collisions do not happen conveniently so that researchers can have competent observers with instruments on hand to record pertinent data," Mr. Roth points out. "This is why the study of crashes by stunt men is valuable. Their performances are the only head-on collisions scheduled in advance."

Science News Letter, July 22, 1950

E FIELDS

BOTANY-MEDICINE

Cancer in Plants May Be Key to Human Cancer

► **CANCER** in plants may some day give science the key to human cancer. For fundamental work on diseased growth, plants can be studied in large numbers while growing in rigidly controlled chemical gardens.

Plant cancers seem to be started by physical or chemical factors which act as trigger mechanisms. After the trigger is pulled, what happens depends upon the gun and the way the gun is loaded, the International Botanical Congress heard in a paper written by Drs. A. J. Riker and A. C. Hildebrandt, plant pathologists at the University of Wisconsin.

Some 100,000 separate pieces of plant tissue were studied by the two scientists. They found that the basic substances which give plants their nutrition from the soil can both speed up and slow down diseased growth, depending upon the amounts of various nutrients present.

"For normal growth, a number of factors seem to operate in a suitable balance," Drs. Riker and Hildebrandt reported. "For diseased growth, these factors may be out of balance in one way or another."

When the trigger of cancer is pulled, in more vivid terms, the gun may have a high-powered load, a normal charge, or the powder may be wet.

Object of the Wisconsin studies, supported by the American Cancer Society, the Donner Foundation and the Wisconsin Alumni Research Foundation, is to find a way in which the powder keg of human cancer may perhaps be given a good wetting down.

Science News Letter, July 22, 1950

INVENTION

Better Coat, Paint Saved In Hot-Spray Process

► **PAINT** near the temperature of steam is applied by spray in a new "hot spray" process for which the necessary heating equipment has now been developed. Varnish and lacquer can be applied by the same method.

In the process, heat replaces a large part of the solvents now used in paint. This means that a higher percentage of solid material and pigment is applied, and surfaces are better covered with the lasting materials. Drying time is also decreased due largely to the decreased quantities of solvents used.

Flow characteristics of the heated paint are better than in cold paint spraying. What

painters call sags, runs and peels are eliminated. The "hot spray" process means a reduction in the amount of paint required, and also in the amount of "thinner" and work needed. Lower pressure is required. This results in a saving because fewer particles of the paint are wasted by being blown away from the surface being covered.

Hot spraying equipment developed by Bede Products, Inc., sucks paint, varnish or lacquer from the original containers through the heating chambers and keeps the heated material in a constant circulation between the heater and spray gun by means of a double hose. This cuts cooling losses in the gun connection and assures a high-temperature delivery.

Science News Letter, July 22, 1950

MEDICINE

Terramycin Stops Kidney Infections

► **TERRAMYCIN**, one of the newest antibiotics, is succeeding in the treatment of kidney and bladder infections where other antibiotics and sulfa drugs have failed.

In a seven-day course of treatment to a group of 24 patients at University Hospital in Ann Arbor, Mich., the new drug cured six and temporarily improved 14 others. Four cases showed no response, Drs. Reed M. Nesbit, John Adcock, William Baum and Cora Owens report.

All the patients had been previously treated with penicillin, sulfa drugs and other antibiotics. Although terramycin effected a cure in only 25% of the cases, the fault lies with the body tissue and not the drug, the doctors indicate. The tissue's ability to fight infection is impeded by chronic inflammation, they declared.

Science News Letter, July 22, 1950

PHYSICS

Large-Scale Development Nuclear Power Not Imminent

► **LARGE-SCALE** development of nuclear power is unlikely before ten years, the World Power Conference was told in London.

Sir John Cockcroft, director of Britain's Atomic Energy Research Establishment, outlined the problems to be solved in putting atoms to work for humanity. Many of these problems were stressed by Dr. Ward F. Davidson of Consolidated Edison Company of New York, who stated that the technical problems to be solved are proving more difficult than was expected.

Dr. L. Kowarski, scientific director of France's Atomic Energy Commission, reported on the progress of nuclear developments in that country. He said that the possibilities of further atomic progress in France on a widened basis would be largely dependent on the world situation two or three years hence.

Science News Letter, July 22, 1950

Evidence for Duplex Neutron Discovered

► **EVIDENCE** for the existence of a duplex neutron, called the "dineutron," which is a momentary merging of two of the atomic particles that trigger the A-bomb, has been obtained at the Los Alamos Laboratory of the Atomic Energy Commission.

The existence of the dineutron appeared demonstrated during investigation of the bombardment of tritium by tritium, a reaction of great interest because it has been suggested as one of those involved in the so-called hydrogen bomb. Tritium is the radioactive triple weight variety of hydrogen, unknown in nature but made in atomic reactors.

Researches with tritium were reported by Dr. A. Hemmendinger of Los Alamos to a physics meeting held under the auspices of the Oak Ridge National Laboratory. A result of the tritium-tritium reaction was that two neutrons given off were coupled together as a composite particle for a short time.

Science News Letter, July 22, 1950

GENERAL SCIENCE

USSR-US Seed Relations Follow Golden Rule

► **IF** the United States deliberately tried to infect Russia with insects, weeds and plant diseases through Lend-Lease shipments during World War II, then it was trying to spread havoc on its own farms as well.

The same inspection was given seed shipments to Russia as was made on seed for our own use, officials of the Department of Agriculture revealed.

A Russian magazine charged recently that Lend-Lease food and seeds were infected artificially to sabotage Soviet crops.

Of course there were seeds of noxious weeds mixed with shipments of food seeds, U. S. experts said. It is humanly impossible—without going through millions of tons of tiny seeds one by one—to certify that a load of seed is 100% pure. But U.S. seed inspection does certify that a given shipment is perhaps 99% pure—and we did that for the Russians.

"Those fellows came in here with a list of plant diseases, weeds and insects which included everything under the sun," said one exasperated expert.

"We told them we wouldn't even consider the list," he said. "We further told them, however, that no seeds would be sent over which would not pass inspection for our own use."

"The Russians never said they would accept the seed on that basis," the official continued—"but they certainly accepted it as fast as we sent it."

Science News Letter, July 22, 1950

ASTRONOMY

Jupiter Comes into View

Mars and Saturn are disappearing from view, but Jupiter will be visible for about three months. Jupiter, the giant planet, is the only one that can boast 11 moons.

By JAMES STOKLEY

➤ **ALTHOUGH** three planets may be seen these August evenings, two of them are about to disappear from view for a while. The third, however, is just coming into sight and will be with us for the next few months.

This is Jupiter, largest of the planets, which is shown on the accompanying maps in the southeast in the constellation of Aquarius, the water carrier. These maps give the appearance of the heavens at about 10:00 p.m. at the beginning of the month, an hour earlier around the fifteenth and about 8:00 p.m. at the end. (Add one hour if you are on daylight time.)

The other two evening planets are Mars and Saturn which have been visible during the spring and early summer. Saturn is in the constellation of Leo, the lion. At the first of August it sets about an hour and three-quarters after the sun. Thus it is not shown on our maps, because it is below the horizon by the times for which they are made.

Mars is farther east in Virgo, the virgin, part of which is shown on the southern map toward the west. Thus Mars barely appears on the map. And it is so low that absorption by the greater thickness of atmosphere its light has to penetrate reduces the brightness considerably below first magnitude.

Jupiter Very Bright

Jupiter's magnitude just now is minus 2.4, brilliant enough to make it most conspicuous even though it, too, is somewhat dimmed by its relatively low altitude. It is about ten times the brightness of the most brilliant star now seen. This is Vega, in Lyra, the lyre. Vega is shown on the map of the southern skies almost directly overhead.

Our second brightest star on August evenings is Arcturus, which is about 90% of the brilliance of Vega. Arcturus is in the constellation of Bootes, the bear-driver, high in the west. A good way to locate it is to start with the great dipper which is part of Ursa Major, the great bear, in the northwest. In the lower part of the dipper are the pointers which show the direction of Polaris, the pole star. The curve of the handle, if followed, brings you to Arcturus.

Immediately below Lyra toward the east is the figure of Cygnus, the swan, in which there shines the first magnitude star Deneb

Part of Cygnus is shown on the map of the southern half of the sky and part on the northern. Deneb can be found in the northern section.

Just south of Cygnus are two interesting small constellations. These are Delphinus, the dolphin, and Sagitta, the arrow. South of them we come to Aquila, the eagle, with still another bright star, called Altair.

Fifth of the first magnitude stars now to be seen is low in the south in the constellation of Scorpius, the scorpion. The star is Antares, a name which means "rival of Mars," given on account of its red color which makes it resemble that planet. It is supposed to mark the heart of the scorpion, whose tail curls down and then up again in the south.

"Shooting Stars"

About Aug. 12 we will have an excellent opportunity to see meteors, or "shooting stars," belonging to the Perseid shower. They are so called because they seem to radiate from the constellation of Perseus, the champion, which rises in the northeast about midnight. With a dark and clear sky it is usually possible on any night to see two or three meteors every hour before midnight, and more in the early morning. However, during the night of Aug. 11-12, the numbers seen may rise to one per minute.

At this time of year we meet a swarm of these particles, most of them no larger than a pinhead, and the frictional heat generated when they hit the atmosphere causes them to burn up in a flash of light. Actually they are moving through space

in parallel paths, although they seem to converge in the distance, like the tracks of a railroad. That is why they appear to radiate from the point in Perseus. Since the moon will be new on Aug. 13, it will be out of the sky when these meteors are most numerous and its glare will not interfere with our seeing them as it sometimes does.

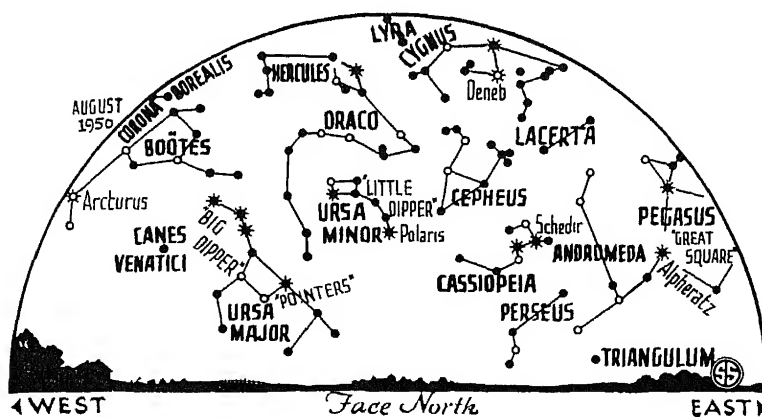
In addition to the three planets of the evening sky, another can now be seen in the early morning hours. This is Venus which is in the constellation of Cancer, the crab, and rises in the east about two hours before sunrise. It is even more brilliant than Jupiter. Mercury this month is too close to the sun to be seen.

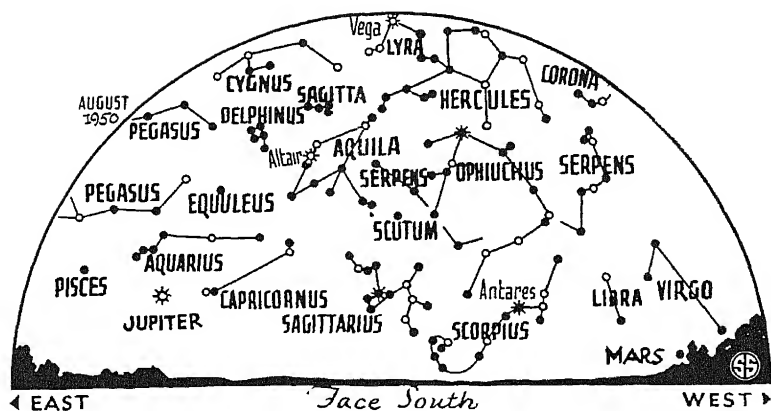
Jupiter and Earth Differ

Knowing that the earth is one of the planets that, with the sun around which they revolve, form the principal parts of the solar system, we are sometimes inclined to think of our globe as typical, and to assume that the others are more or less the same. However, Jupiter, which has now come into the evening sky, is very different from the earth. For one thing, the fact that it has 11 moons, some of them bigger than our lone satellite, is a mark of distinction. This is a larger number than for any other planet.

The globe of Jupiter differs considerably from earth. Whereas our diameter is about 7,900 miles, that of Jupiter is about 11 times as much, or 87,000 miles. This is a mean value, since it is nearly 6,000 miles less, measured from pole to pole, as it is across the equator of the planet. Looking at Jupiter, even through a medium-sized telescope, the elliptical shape is easily apparent.

The reason for this bulge at the equator is found in the rapid rotation of the planet, which takes place in a little less than 10 hours, causing considerable centrifugal force. This whirls the equatorial material several thousand miles farther from the center than at the poles, which is not subjected to such forces.





★ * ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

From the way that Jupiter pulls on the tiny planets called asteroids, as well as on its satellites, it is possible to determine its mass with considerable accuracy. It turns out to have about 318 times the amount of material making up the earth.

Knowing Jupiter's mass, and how fast it spins, astronomers can calculate the centrifugal force at the equator, and how much it would bulge if its material were distributed uniformly throughout its globe. On this basis, however, it turns out that it should bulge even more than it does, proving, therefore, that the material is not uniformly distributed. Instead, the bulk of the mass must be concentrated at the center core, with lighter kinds of stuff in the outer layers, so light in fact that they must be largely gaseous.

Jupiter Gaseous

Moreover, the gaseous character of the outer layers of Jupiter is confirmed by the remarkable changes that occur in its surface features. Most conspicuous of these, when it is viewed through a telescope, are the red and brown belts which cross its surface parallel to the equator. These are continually changing their details, with spots appearing and vanishing. The surface at the equator turns more rapidly than the parts nearer the planet's poles, additional evidence that we are not looking at a solid surface.

Analyzing, by means of a spectroscope, sunlight reflected by Jupiter, we find dark bands at certain wavelengths which have been absorbed by some material in the planet's atmosphere. These have been shown to be due to the gases we know as methane, or "marsh gas," and ammonia. Hydrogen, also, is probably most abundant in the atmosphere, but it causes no bands that can be observed. Nitrogen is the chief element in our atmosphere, but what there has been in that of Jupiter has probably combined with the hydrogen to form ammonia, which contains both these elements. Oxygen, that may once have been present, has likewise probably combined with the hydrogen to form water. At the low temperature prevailing there, because of its great distance

from the sun, this would doubtless have frozen and fallen far out of sight.

Structure of Jupiter

According to Dr. Rupert Wildt of Yale University, who first showed the presence of ammonia and methane on Jupiter, the planet's structure is something like this: At the center is a rocky-metallic core, about six times as dense as water and about 34,000 miles in diameter. Over this is a frozen ocean—a layer of ice some 20,000 miles deep. On the outside, some 6,000 miles in thickness, is a layer of frozen ammonia crystals in an atmosphere of hydrogen and methane. There must also be some unfrozen, gaseous ammonia to cause the observed absorption bands.

Possibly, as Dr. Fred Whipple, of Harvard College Observatory, has suggested, there is no sharp transition between the atmosphere and the ice layer. The clouds may become thicker and thicker with depth, finally turning into a layer of ammonia slush, which becomes solid still farther down. A further suggestion is that since there are brown and red compounds of ammonia in combination with potassium and sodium, these may account for the coloration observed in the surface of Jupiter.

Time Table for August

Aug	EST	
5	2:56 p.m.	Moon in last quarter
6	10:00 a.m.	Moon farthest, distance 251,200 miles
11	9:46 a.m.	Moon passes Venus
12	early morning	Meteors of Perseid shower visible
13	11:48 a.m.	New moon
15	3:01 p.m.	Moon passes Saturn
18	11:01 p.m.	Moon passes Mars
19	midnight	Moon nearest, distance 229,800 miles
	10:35 a.m.	Moon in first quarter
21	6:00 a.m.	Mercury farthest east of sun
26	2:00 a.m.	Jupiter opposite sun and nearest earth; distance 371,200,000 miles
27	6:31 a.m.	Moon passes Jupiter
	9:51 a.m.	Full moon

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, July 22, 1950

CHEMISTRY

Mercuric Chloride for Better Watered Farms

➤ MORE water in U. S. farming areas where irrigation means the difference between prosperity and drought—that is the promise of the chemical mercuric chloride and a trick known as "water spreading."

In areas such as California's San Joaquin Valley, irrigation pumping is threatened by lowering water tables. More water is being pumped from wells than is being replaced each year. Yet in the spring as mountain snows melt—or during infrequent cloud bursts—there is so much water that local floods result.

Irrigation engineers are experimenting with "water spreading" to conserve this occasional heavy run-off of water. The idea is to divert it to shallow dike-enclosed reservoirs, where it will stand still long enough to soak into the subsoil.

But when soil is continuously submerged for a few weeks, micro-organisms in the earth multiply, choking the tiny channels through which the water can filter downward.

Mercuric chloride may be the answer. A very small amount of the disinfectant chemical added to water will kill the obstructionist microorganisms, and keep the water percolating into the subsoil storage layers.

Science News Letter, July 22, 1950



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PSYCHIATRY

Frigidity in Women

► TRUE frigidity in women, one of the most common problems in gynecology, is a neurotic illness due solely to psychologic factors

Physicians specializing in this branch of medicine which deals with woman's constitution and diseases should therefore be aware of these psychologic factors and prepared to deal with them from the psychiatric viewpoint, Dr. William S. Kroger of Chicago and Dr. S. Charles Freed of San Francisco advise fellow physicians through a report to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (June 10).

True frigidity, they state, cannot be cured by appealing to the patient's conscious processes. Threats and recriminations are valueless. If the gynecologist has been trained in psychiatry he can use hypnoanalysis to bring to light the unconscious feelings that are at the root of the patient's frigidity.

Gynecologists and obstetricians, however, must know their limitations in the field of

psychiatric treatment lest they do more harm than good, Drs. Kroger and Freed point out.

Among important underlying causes of true frigidity the physicians give the following unconscious feelings and conflicts

1. Guilt feelings because of infidelity or hostility to the husband because the woman thinks he is unfaithful. Ordinary re-education and discussion are useless in these cases. The patients must be referred to the analytically oriented psychiatrist.

2. Religious or moral attitudes taught in childhood. Though the present generation has had better sex education than its predecessors, sex is still "taboo, dirty and sinful to a large number of frigid women."

3. Arrested emotional development at the level of childhood when the love object is the parent of the opposite sex.

4. Hostility toward all men.

5. Latent homosexuality.

6. Narcissism, or too much self-love.

7. Emotional immaturity.

Science News Letter, July 22, 1950

AERONAUTICS

Air Navigation Aid

► AN IMPORTANT forward step in flying safety is a contract recently signed in Washington by the U. S. Civil Aeronautics Administration for 450 ground stations equipped with distance measuring apparatus.

By means of them, a pilot in flight will continuously know his distance from a radio range. The equipment, known as DME for short, will use radar-type radio pulse transmission.

The DME transponders are part of a revolutionary new air navigation system being installed for civil and non-tactical use under a program developed by the Radio Technical Commission for Aeronautics. It is a companion device for the 400 new omnirange stations, 300 of which are now in use. These provide static-free radio beams in all directions for pilots to follow.

The DME equipment, as explained by CAA, is one of the electronic miracles born during the last war. It is a much-improved and modified version of the radar beacons, known as "racons." It operates on very high frequency in the static-free part of the radio spectrum.

In use, aircraft must be fitted with a special radio transmitter and receiver. The transmitter sends out coded pulses of radio energy. The ground-based DME equipment receives these pulses, and then hurls back another set of radio pulses to the plane. The time required for the "round trip" is measured by the receiver in the plane, and translated into miles for the pilot.

Each DME ground station can serve 50 aircraft at the same time. With modifications it could serve more. Its normal range is about 40 miles for a plane at 1,000-foot altitude, and up to 200 miles at very high altitudes.

Under the contract signed, the first DME transponder will be delivered to the CAA for testing late this year. Others will follow, reaching 40 units per month by June, 1951. The contract is with Hazeltine Electronics Corporation, Little Neck, L.I.

Science News Letter, July 22, 1950

NUTRITION

Vitamin Diet: Codfish Livers and Cod Liver Oil

► IN the vitamin age of the future, young poultry and livestock—perhaps even children—will be given codfish livers as well as cod liver oil.

A new method of extracting the important oil from fish livers, oil-rich in vitamins A and D, has led to the discovery by Canadian fisheries scientists that the liver residue carries as much of the B-complex vitamin group as beef liver and pork liver.

The vitamin B group is drawing increasing attention from nutritional experts. It includes the vital substance called APF, or animal protein factor, as well as food elements which combat pernicious anaemia. More and more poultry raisers in par-

ticular are including dried fish meal in their chicks' diet.

As a source of these vitamins, codfish liver residues could revitalize the ailing cod liver oil industry on this side of the Atlantic, the Fisheries Research Board of Canada indicates in its annual report.

Dr. F. A. Vandenheuvel, chemist at the Canadian government's experiment station in Halifax, Nova Scotia, achieved a new and much more efficient way of separating the oil from cod livers last year. This spring the method, employing centrifuges and a chemical reaction, was tried out for the first time on a commercial scale by a cod liver oil producer.

Science News Letter, July 22, 1950

AERONAUTICS

Supersonic Plane Pilots Need Electric Eyes

► PILOTS of supersonic planes will need electric eyes to avert collisions in midair. And fighting at supersonic speeds will be "very difficult." Figures on the speeds of these planes and the speed of human vision and reaction time show this.

The comparative figures were reported by Col. Victor Byrnes, chief of the department of ophthalmology at the U. S. Air Force School of Aviation Medicine, Randolph Field, Tex., at the Pan-American Conference on Prevention of Blindness in Miami Beach, Fla.

If two aircraft came out of the clouds 8,000 feet apart coming toward each other, they would collide before either pilot could do anything about it," he declared.

"If they came out of the clouds head-on at a distance 500 feet apart, they would collide without either pilot having seen the other."

With flying speeds in excess of the speed of sound now an accomplished fact, engineers are publicly predicting speeds of 1,800 miles per hour for the not too distant future, he pointed out.

"At a speed of 2,000 miles per hour the pilot could not turn a circle smaller than 18 miles in diameter, and unless wearing a good protective suit or assuming a position other than upright, he would be blacked out all the way around the turn," Col. Byrnes stated. "Aerial combat under such conditions would be very difficult."

At a speed of 1,800 miles per hour, a pilot travels about a mile every two seconds. It takes about four-tenths of a second for the image of an on-coming plane to be relayed to his brain, during which time his plane has travelled nearly one-fifth of a mile. But during this time and distance he has not yet recognized the image, he has only seen it. Recognition takes another second, on the average, during which the plane travels another 2,640 feet.

Supersonic craft, Col. Byrnes said, are now being fitted with electronic devices which can react faster than man.

Science News Letter, July 22, 1950

MEDICINE

Man-Made ACTH Soon

► THE day when ACTH, powerful anti-arthritis hormone of the pituitary gland, can be synthesized may be closer than anyone now realizes.

Dr. C. H. Li, University of California researcher who first isolated the hormone before its value in arthritis was known, now takes this optimistic view.

"I have a feeling now that we will be able to synthesize it," he said.

The "feeling," he explained, is like the feeling he has had before when he was working on the isolation of pituitary gland hormones. After a period of discouragement when the work seemed almost to stand still, he got a feeling that finally he was on the right road to his goal. Success in the isolation soon followed.

Now he has reported to the JOURNAL OF THE AMERICAN CHEMICAL SOCIETY (July) that he has found a way to triple the potency of ACTH. This, in effect, triples the supply, since the same quantity of the more potent material will do three times the work of the former material.

The method consists simply in boiling ACTH in an acid solution. The potency of a powerful peptide fraction of ACTH can also be tripled by the same acid boiling treatment. This peptide fraction of ACTH has been given to four arthritis patients with the same beneficial results as are obtained by ACTH itself.

FSH, another pituitary gland hormone, can now also be broken down into peptide fractions, Dr. Li reports. This hormone holds the key to fertility in both male and female. It is known as the follicle stimulating hormone, or FSH, because in the female it stimulates the growth of the ovarian follicles, making ovulation possible. In the male it may stimulate the tubules which produce sperm for fertilizing the ova.

Obtaining biologically active fractions of FSH may lead to synthesis of this pituitary hormone also. At present, the sole supply is from slaughtered livestock. Amounts available of the pure hormone are so small that adequate animal experimentation has not even been possible.

Science News Letter, July 22, 1950

AGRICULTURE

Weeds Fight 2,4-D

► WEEDS are fighting back. Just as super-strains of the pesky housefly have been found which can laugh at once-deadly DDT, now a grassy weed in Louisiana sugar cane is reported developing resistance against one of man's newest, most potent weed-killers—2,4-D.

The discovery was made by Leo Hebert, plant scientist at the Department of Agriculture's sugar crops laboratory at Houma, La. It was revealed in a regular work progress report to Washington.

The weed with growing immunity to 2,4-D is called Johnson grass. When sugar cane fields were first treated with the chemical, nearly all of the Johnson grass was killed. From the few surviving plants, however, the government sugar scientist saved seeds.

This year his suspicions were confirmed. Second-generation seedlings, offspring of the hardy plants which survived the first dose of 2,4-D, were found to be twice as resistant to the weedkiller as plants of the previous generation.

Johnson grass is really not a weed. It was introduced into the South as a forage crop for livestock more than a century ago. Since then it has spread widely, however. Growing profusely in sugar cane and cotton fields, it has become a top-ranking plant pest. The government considers it the No. 1 enemy of sugar cane today.

The plant specialists found that a relatively low dose of 2,4-D, applied early in

the spring before the weed had pushed through the soil, reduced the emergence of Johnson grass seedlings by as much as 95%. Other pests, such as alligator weed and tie vine, were equally well controlled.

But when similar treatments were given to second-generation Johnson grass, twice as many seedlings pushed up through the soil as the year before. They were apparently resistant to the chemical.

Department of Agriculture officials say the study of Johnson grass will be continued to see if the resistance grows. They seemed to think it would.

It now appears that chemical weed control is another field in which science must always look for something new, just as it has had to do in the fight on house fly strains showing resistance to DDT, said the glum official announcement of the Johnson grass discovery.

Science News Letter, July 22, 1950

PHYSICS

Artificial Meteors from Bazooka-Like Experiment

► ARTIFICIAL meteors have been created and photographed in the laboratory at the Carnegie Institute of Technology, Pittsburgh. The metal jets formed have velocities comparable to real meteors (which come into the earth at about 11 miles per second speeds), Dr. E. M. Pugh reported

to the American Physical Society in Washington.

As the slugs rip through the air, the head end becomes incandescent from friction, and the metal vapor trails coming from the tip are clearly seen in the photographs.

A refinement of the war-time bazooka charge was the source of the laboratory shooting stars. To make them, an explosive is hollowed out making a conical recess. Fitted tightly into this is an accurately machined metal cone. Accuracy here is essential to get a clean jet that can be photographed, Dr. Pugh emphasized. Other attempts to photograph the jets had been prevented by a shroud of misdirected particles surrounding the main jet which were due to inaccurate alignment.

Super-high-speed camera techniques are a must for such photographs, and some of these details were revealed by Dr. Pugh's collaborators R. Heine-Geldern, Simon Foner, and E. C. Mutschler. The light source is a wire exploding under an overload of electrical current, giving single flashes of 500,000,000 candle power. An ordinary mechanical shutter, good to a thousandth of a second, is far too slow to stop meteors in their tracks. The electrical Kerr cell technique, with operating voltages of 25 kilovolts, was found necessary to give the shutter speed of one millionth second.

Besides meteors, the collaborators, who were working under a contract with the office of the Army's Chief of Ordnance, studied such things as the way an explosive explodes, what happens when two explosives go off simultaneously near each other, and how shock waves travel through metals.

Science News Letter, July 22, 1950

PHYSICS

Color Photos Made Quickly

► COLOR photographs, better for war-time camouflage detection, are made in quick time and as easily as black-and-white prints by a process developed in Dayton, Ohio, at Wright-Patterson Air Force Base.

With the new method the time required for processing color film is reduced from 90 to 20 minutes, and the printing time from 90 to 15 minutes. The time saving is of particular importance from a military standpoint.

Basis of the new method is a pre-hardener which permits the processing to be done at 80 degrees Fahrenheit instead of the 68 to 70 degrees used ordinarily. The hardener prevents the emulsion from becoming too soft at the higher temperature. All ordinary standard chemicals previously used in Air Force color processing kits have been altered to meet the new requirements.

Science News Letter, July 22, 1950

ZOOLOGY

NATURE
RAMBLINGS

Toads and Frogs

➤ BOOKS give various clues whereby the layman can distinguish toads from frogs. In general toads are predominantly land-lubbers with bumpy dry skin and broad plump bodies. Frogs are generally aquatic with smooth moist skin and more streamlined bodies.

But there are so many exceptions in each particular that the distinction often disappears. Both frogs and toads are amphibians, a class they share with newts and salamanders.

The name amphibian comes from a Greek word meaning living a double life. Amphibians are equally at home on land or in the water. This versatile ability to thrive in either element is nowhere more startlingly demonstrated than in the tadpole stage of frogs and toads.

When a frog egg hatches, the newborn offspring is a strange-looking little creature that seems to be a tiny fish. It swims like a fish and it has gills that enable it to breathe like a fish. But in the course of a few weeks the tail grows longer and hind legs begin to develop. Eventually the two forelimbs, which have been forming unseen beneath the skin, are pushed out through the gill slits.

By now it has ceased to be an exclusively aquatic creature and is well on its way to fulfill its destiny as an adult frog or toad. It develops lungs. The tail, which at this stage is less a swimming instrument than a food reservoir to tide the youngster over the transition period, gets slowly smaller and smaller until it disappears altogether.

Since most waters abound with predatory enemies which spend the better part of their time cruising about looking for a bite of lunch, the life expectancy of tadpoles is not very high. To compensate for this, nature produces tadpoles in great numbers so that enough will survive into maturity to insure the perpetuation of the species.

Some frogs skip the tadpole stage entirely. There is one African frog which carries its fertilized eggs in its mouth, not eating until the baby frogs are hatched out. Some Latin American species carry the tadpoles

on their backs, affixed by specialized sucking mouths.

One of the most remarkable is the Surinam toad of Brazil and the Guianas. Its back looks as though it had caught a shotgun blast, being pockmarked with innumerable hollow cavities. By dint of the

most strenuous cooperation of the male, the fertilized eggs are forced into the pockets. In time the eggs hatch out, and the youngsters play midwife to their own births, clambering into life on their own power as they squirm out of their mother's back.

Science News Letter, July 22, 1950

MEDICINE

Report on Antihistamines

➤ LATEST medical report on the antihistamines in the treatment of the common cold states that there is "no indication" that they "have any important effect on the duration or severity of these infections of the upper respiratory tract."

The report is from Drs. Donald W. Cowan and Harold S. Diehl of the University of Minnesota Students' Health Service.

They started their controlled experiment in the fall of 1948. They had intended running it for two years, but because antihistamine drugs were released for over-the-counter sale in the fall of 1949, they stopped the study then. The reason was that they thought there would be some difficulty in keeping the control group, which did not get the antihistamines, strictly controlled.

The study was made on 367 University of Minnesota students who volunteered for the study because they were especially susceptible to colds and colds constituted a real problem to them. These 367 students treated 980 colds between December, 1948 and April, 1949.

The antihistaminic drugs used were theophorin and pyribenzamine. Ascorbic acid, or vitamin C, was also tested because an earlier experiment by Drs. Cowan and Diehl suggested a possible though slight

effect of this chemical in preventing colds.

The drugs under trial and a placebo which looked and tasted the same but had none of the on-trial drugs in it were given to the students in rotation as they enrolled for the study. They were also given directions to start taking the medicine at the first symptoms of a cold and to take it every four hours thereafter till the cold was "cured" or till their supply of 10 doses was used up.

With each of the medicines and with the placebo the colds lasted between five and six days.

Many enthusiastic reports were received from students in the experiment. Some of the "most glowing testimonials came from members of the control group," the doctors state.

A year after the experiment a student who had graduated made a special trip to Minneapolis from the northern part of Minnesota to get some of the medicine he had taken. When the doctors checked the records, they found he had been in the group getting the placebo, or mock medicine.

Details of the study are reported to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (June 3).

Science News Letter, July 22, 1950

PHYSICS

➤ FURTHER proof of the usefulness of thorium in the production of A-bombs was revealed at the meeting of the American Physical Society in Mexico City.

Fission of thorium atoms, like fission of uranium atoms, produces both light and heavy elements. Dr. A. Turkevich and J. Niday of the University of Chicago and the Argonne National Laboratory in Chicago told the meeting.

Also, like uranium, thorium fission is similar to slow neutron fission in being highly asymmetric. While thorium, by itself cannot sustain a chain reaction, like the bread crumbs in a meat loaf, if combined with uranium it serves to stretch out the uranium and make it go farther.

The two Chicago scientists identified 19 different light and heavy elements that resulted when thorium was split in the laboratory.

Thorium is much more plentiful than uranium and so should permit the manufacture of many more A-bombs.

Science News Letter, July 22, 1950

ENTOMOLOGY

Starlings Feast
On Insect Pests

➤ DON'T berate the starling, famed mimic of the bird world. Though it often is branded a nuisance, a bulletin of the Smithsonian Institution reported that the starling is a major enemy of an even greater nuisance—insects which are gnawing U.S. crops this year. The starling devours vast numbers of Japanese beetles, potato beetles, caterpillars and weevils.

Science News Letter, July 22, 1950

Books of the Week

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AIRCRAFT ENGINE MAINTENANCE AND SERVICE—Rollen H. Drake—*Macmillan*, 237 p., illus., \$5.00. Presents the fundamentals of aircraft maintenance in non-technical language. For laymen, students, teachers and certified aircraft engine mechanics. Profusely illustrated.

ANIMALS AND THEIR BEHAVIOUR—Maurice Burton—*Edward Arnold* (Longmans, Green), 144 p., illus., 60 cents. The behavior of some of the more common animals is discussed.

THE CAVE BOOK—Charles E. Hendrix—*Earth Science*, 68 p., illus., paper, \$1.00. The science of caves (spelology), explained for the general reader.

CONTRIBUTIONS TO THE FLORA OF SOUTH AMERICA—Studies on Andean Compositae—I; Studies in South American Plants—II—Jose Cuatrecasas—*Chicago Natural History Museum*, Fieldiana, Botany, Vol. 27, No. 1, 113 p., illus., paper, \$1.75. New species of *Senecioneae* from Colombia, Venezuela and Ecuador, collected chiefly by the author, are described.

THE EARTH FOR THE LAYMAN—Mark White Pangborn—*American Geological Institute*, Report No. 2, 50 p., paper, \$1.00. Titles of 625 books covering the gamut of non-technical reading from novels with a geological background or the identification of common fossils, to instructions on how to identify minerals and grind the facets on a gemstone.

HUMANISM IN AN AGE OF SCIENCE—John Farquhar Fulton—*Schuman*, 26 p., paper, 75 cents. A Ludwig Mond Lecture delivered at the Manchester School of Medicine on October 6, 1949, dealing with the interrelations between science and literature.

THE JAPAN SCIENCE REVIEW, Engineering Sciences, Vol. 1, No. 1—*Engineering Society of Japan—Association for Science Documents Information*, 212 p., paper, \$5.00 per year, \$1.50 single copy. A quarterly bringing together representative Japanese scientific papers translated into English.

POCKET GUIDE TO ALASKA TREES—Raymond F. Taylor and Elbert L. Little, Jr.—*Gov't. Printing Office*, U. S. Dept. of Ag., Agriculture Handbook No. 5, 63 p., illus., paper, 25 cents. A revision of the booklet first published in 1929 in response to the need of a nontechnical description of Alaska's tree species.

REQUIREMENTS FOR OFF-STREET AUTOMOBILE PARKING FACILITIES IN ZONING AND OTHER LOCAL ORDINANCES—David R. Levin—*Highway Research Board*, Bulletin No. 24, 108 p., illus., paper, \$3.00. This bulletin consists of an analysis, in two parts, of the requirements for provision of parking facilities in connection with various property uses, as contained in 155 local ordinances.

REVIEW OF THE ESTONIAN OIL SHALE INDUSTRY, WITH A BRIEF ACCOUNT OF OIL SHALE DEVELOPMENT IN THE UNITED STATES—Peter O. Krumm—*Engineering Experiment Station*, Circ. No. 50, 125 p., illus., paper, \$1.00. (See SNL July 15, 1950, p. 45).

THE STATE FAIR BLUE RIBBON COOK BOOK—Lois J. Hurlev and Isabelle J. Groetzing—*Fell*, 256 p., illus., \$2.95. A history of State Fairs as well as prize recipes is included.

STELLAR EVOLUTION. An Exploration from the Observatory—Otto Struve—*Princeton University Press*, 266 p., illus., \$4.00. An historical account of research on the origin and the evolution of stars.

THEORETICAL INVESTIGATIONS ON THE EFFICIENCY AND THE CONDITIONS FOR THE REALIZATION OF JET ENGINES—Maurice Roy—*National Advisory Committee for Aeronautics*, Technical Memorandum 1259, 238 p., paper, free upon request to publisher, 1724 F St., N.W., Washington, D.C. Translation from the French.

TRANSACTIONS OF LEGAL CONFERENCE—Industrial Hygiene Foundation of America, Inc., Bulletin No. 12, 50 p., paper, 75 cents. A report summarizing legislative developments in workmen's compensation, state industrial hygiene codes, air-pollution regulations, and trends in health and sickness disability benefits.

Science News Letter, July 22, 1950

EDUCATION

Educational Steps In Point Four Program

➤ THE Point Four program must include an educational effort as bold, new and imaginative as the technical assistance effort, a commission of the National Education Association warned in a report issued in Washington.

New and strange elements will be introduced into the cultures of other nations, the experts observed. Not only the ways but also the ends and values of life will be affected.

"The clear purpose of the program," the Educational Policies Commission report says, "should be to assist the people of each participating country to improve their condition." We must avoid even the suggestion of exploitation of the weak, of "dollar diplomacy," of "cultural imperialism." We must avoid imposing through economic pressure a way of life or a political philosophy.

It was recommended that the educational program embrace non-school as well as school agencies. All Americans participating should receive special preparation for their duties. The "rich ethnic resources" of America should be fully utilized, the report advised, recommending that talent present in our Negro citizens be sought out in working with technically undeveloped peoples, the majority of whom belong to the colored races.

Specialists of other countries should be trained in the United States, and selected

young men and women should study our development of industrial civilization.

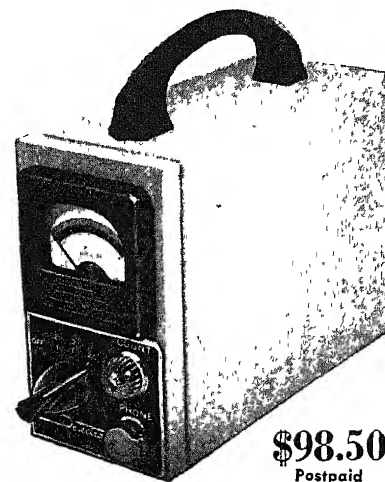
The American people must be prepared for a long and sustained effort; the educators warned.

The colonial peoples are rising, the report said in arguing for the Four Point program. Approximately two-thirds of the people of the earth are caught in a vicious circle of ignorance, poverty, disease and hunger. Nevertheless, a life of economic security and well-being is technically possible for all men. War threatens the very survival of civilization, and the whole world is threatened by a powerful and ruthless totalitarian movement, Soviet Communism. America occupies a position of immense and sobering responsibility, since in terms of industrial strength and military potential ours is the most powerful state in the world.

Science News Letter, July 22, 1950

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⚙️ **SUN GLASS LENS** cuts out reflected glare, heat and sunburn rays. It is a "sandwich" affair, with a center layer of white prescription-ground spectacle glass, an inner layer of glare-absorbing material and an outer layer to absorb both infra-red and ultraviolet rays.

Science News Letter, July 22, 1950

⚙️ **TOUGH PLASTIC** material, developed to bridge the gap between soft rubber and hard rubber, is suitable for low-cost gears to replace metal gears in devices ranging from lathes to washing machines. The plastic gears can be accurately molded and are resistant to chemicals and abrasion.

Science News Letter, July 22, 1950

⚙️ **MANICURE LIGHT** is a broad U-shaped device which rests on one side with the other above. The lower arm has grooves to hold the fingers, while the upper one contains a covered electric bulb to concentrate light directly down on the finger nails.

Science News Letter, July 22, 1950

⚙️ **DRESSMAKING AID** is a plastic measuring and marking device, a one-hand tool as shown in the picture. Marks are made with tailor's chalk to locate exact position



for tucks, buttons, buttonholes, hooks and eyes and other details in sewing and knitting.

Science News Letter, July 22, 1950

⚙️ **EGG-INSPECTION** light utilizes ultraviolet rays to detect fluorescence in the albumen due to infection of certain organisms. This fluorescence can also be detected

in shell eggs, and the light can be employed to show whether or not eggs have been washed.

Science News Letter, July 22, 1950

⚙️ **WHISK BROOM** has its bristles on a base movable within the handle so that the brush itself can be varied in length from near zero to four inches to obtain firmness for serving different purposes. Bakelite styrene plastic forms the bristles and also the five-inch handle-case.

Science News Letter, July 22, 1950

⚙️ **EASY-WEIGH SCALE** is carried in one hand and merely hooked onto the handle of a milk pail or other container. The weight can be seen at a glance on a horizontal dial at the top. Made of cadmium-plated steel and aluminum, the device is less than three pounds in weight.

Science News Letter, July 22, 1950

⚙️ **WALL BRACKET** for a telephone directory has a shelf compartment big enough to hold the largest directory and a top designed with a groove for pencils and a space for a pad. Finished in various colors, it is easily attached to the wall with two screws.

Science News Letter, July 22, 1950

You Know?

Chicks can be raised successfully on all-vegetable rations if the diet is supplemented with vitamin B₁₂.

Experimental work in America with the rubber-producing *guayule* is continuing with a fair degree of success.

"Street couplet" is a term now being used where two parallel streets, one block apart, are used for one-way traffic in opposite directions.

"Traveling creameries" are in use in Ireland; they are in trucks which visit out-lying farms, run the milk through separators, and buy the cream.

The U. S. Navy got its first submarine in 1900; it was the 53-ton, 74-foot Holland, a tiny craft in comparison with present 1,500-ton, 300-foot submersibles.

An experiment, using DDT, to make Cuba's Isle of Pines a mosquito-less resort is under way; this malarial island was the inspiration for Stevenson's "Treasure Island."

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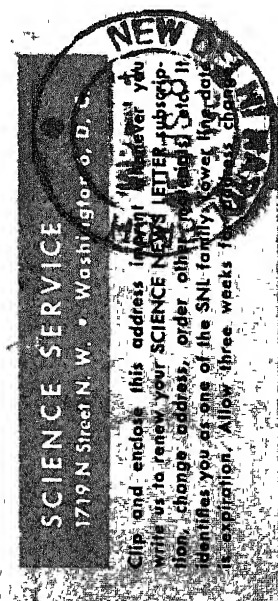
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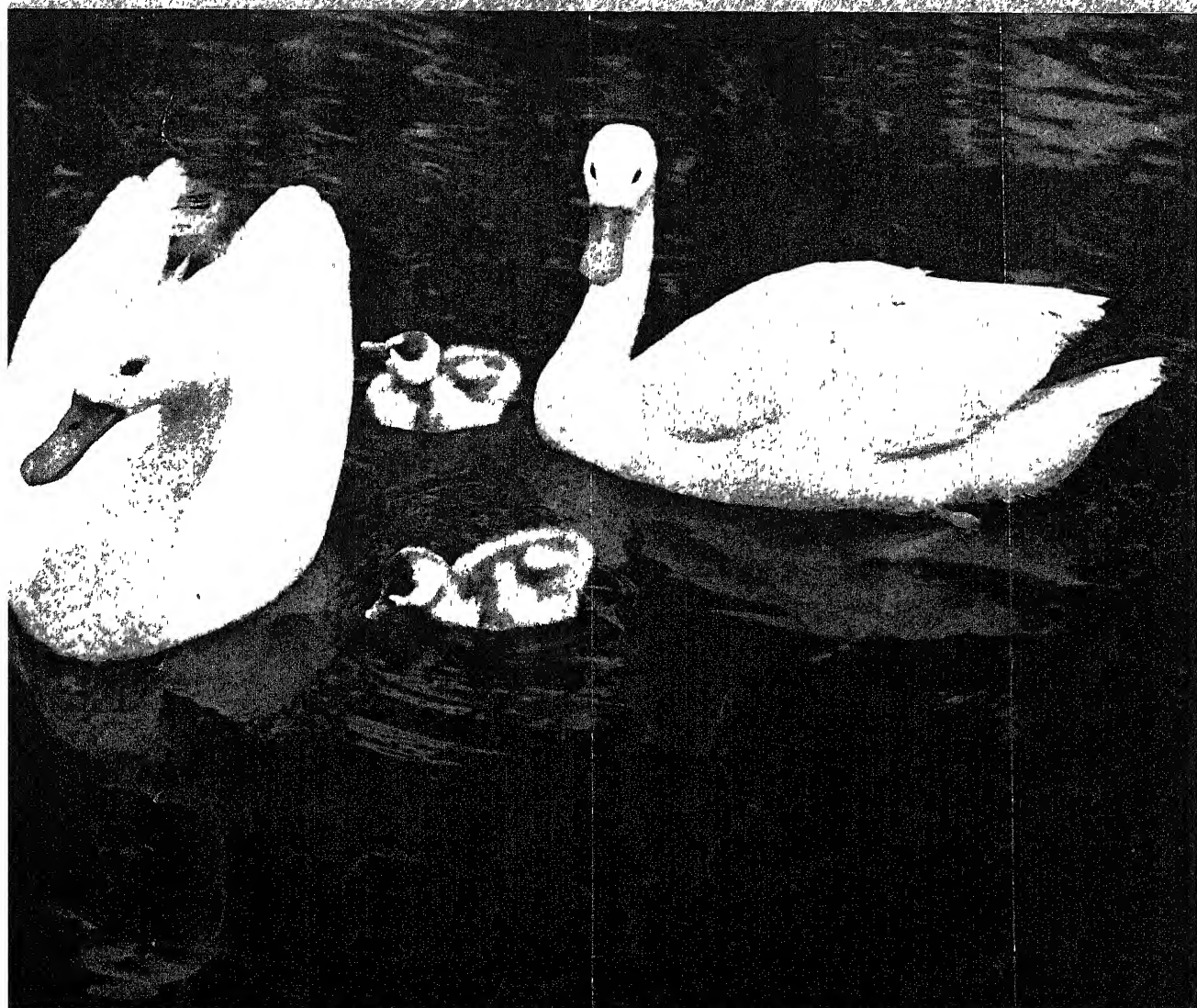
JULY 29, 1950

SCIENCE NEWS LETTER



®

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Baby Coscorobas

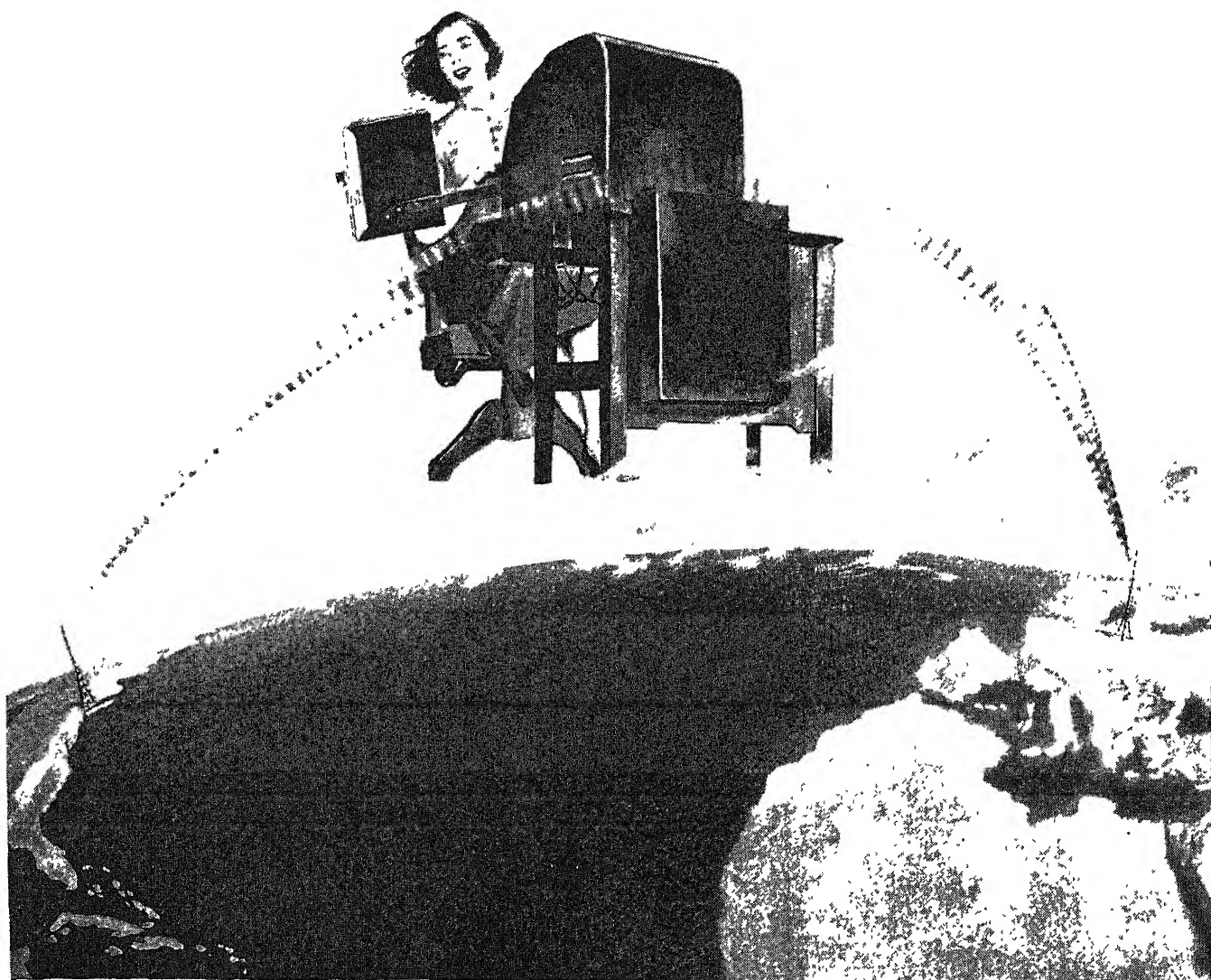
See Page 68

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A SCIENCE SERVICE PUBLICATION



New RCA overseas teleprinter service by radio, first open to the public, now links New York and Holland

Now "Flying Stenographers" span the sea!

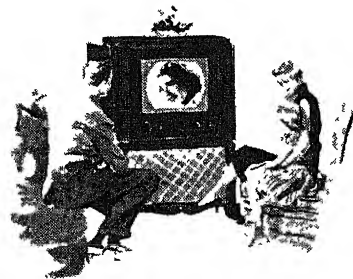
You are familiar with *teleprinter* service which delivers a typed message, by wire, at high speed. Now this useful service takes to the air on a person-to-person basis, and is spanning the Atlantic Ocean by radio!

This new achievement, called TEX, was developed by RCA engineers and European experts. Its heart is an amazing machine that thinks in code, detects errors which may have come from fading or static—and automatically insists on a correction!

If, when RCA's "TEX" is at work, a letter becomes distorted, the receiving instrument rejects the character and sends back a "Repeat, please" signal in fractions of a second—then repeats it until a correct signal is received. Like other RCA advances in radio, television, and electronics, RCA's TEX system helps make radio waves more useful to all of us—and in more ways!

* * *

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RCA Research and pioneering provide a basis for the superiority of RCA Victor television receivers—the best buy on the 1950 market.



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MEDICINE

Leukemias May Be Licked

Cortisone and a chemical which neutralizes folic acid may be the winning team against leukemias. Cortisone alone is not permanently effective.

➤ A TWO-CHEMICAL relay team shows promise of winning the race for a reasonably effective means of checking the leukemias.

This encouraging information was disclosed to an international gathering of cancer researchers at the Ciba Foundation in London by Dr. J. H. Burchenal of the Sloan-Kettering Institute, New York.

Cortisone, the adrenal gland hormone already famous for its effect in rheumatoid arthritis, is half of the combination. Its team mate is a chemical which antagonizes and neutralizes the vitamin, folic acid.

Prior to Dr. Burchenal's disclosure the assembled cancer experts had heard the success-failure story of the use of cortisone alone in the treatment of leukemias. Dr. Burchenal himself had reported the dramatic improvement in many leukemic children and adults given this chemical.

However, the improvement lasted only a

few weeks. Further courses of treatment in relapsed patients might give second improvements in children, but not in adults. Thereafter the effectiveness of the hormone fell off rapidly and the patients died of their leukemias.

Dr. Burchenal's colleagues at Sloan-Kettering, Dr. C. Chester Stock and Dr. K. Dobriner, verified the purely temporary effectiveness of cortisone against lymphatic cancers both in experimental mice and in humans.

The cancer researchers at Sloan-Kettering hope that by alternating cortisone treatment with courses of folic acid antagonists, which have themselves shown temporary effectiveness in checking leukemias, they will be able to bypass the resistance developed by the cancer cells to each of these treatments when used singly.

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PSYCHOLOGY-AERONAUTICS

Flying Psychological Lab

➤ HOW pilots of speedy military airplanes react to problems encountered during flight is being determined in Dayton at the Wright-Patterson Air Force Base with a new-type flying set-up dubbed an Airborne Psychological Laboratory.

High speed in the air calls for double-quick thinking and split-second action. Engineering psychologists at the Air Base are endeavoring to design and develop flight equipment that will permit the operator to function as efficiently and safely as possible.

The airborne laboratory is a C-47 aircraft equipped with special electronic scoring devices which record how accurately pilots are able to maintain heading, altitude, speed and many other variables of flying. The equipment consists of a motor generator, sensing units, a scoring console and a recording console.

Whenever a pilot adjusts his instruments to correct a flight problem the sensing instruments translate the action into electrical impulses which are recorded for future study. On the scoring console are electric stop clocks which indicate the length of time a pilot is "out-of-bounds." This is the time that he is unable to keep within the allowed tolerances for such variables as airspeed, altitude, pitch, angle of bank, rate of turn and others.

A voice recorder and motion picture camera record the pilot's comments and

his eye and body movements during the tests. One of the greatest problems of flying has always been that of fatigue. A pilot may think that a long flight does not tire him, but the instrument scores show that the longer the flight the less able the pilot is to stay within tolerances.

Science News Letter, July 29, 1950

ENGINEERING

Better Heating Oil by Using Furfural as Solvent

➤ BETTER heating oil for use in homes is promised with an extraction unit using furfural as the solvent. This unit will be employed in a new refinery ready for operation in Eagle Point, N. J., by the Texas Company.

The use of furfural will also give improved fuels for diesel engines, and it greatly reduces the sulfur content of both heating and diesel fuels. This is particularly important at the present time because it is now necessary to use oil from new wells which deliver crude oil containing considerable sulfur.

Furfural has been widely used by the oil industry for the removal of sludge-producing elements in motor oils. The new \$60,000,000 refinery is the first commercial extraction unit to employ furfural in the

production of diesel and heating oils. Furfural is an organic chemical that can be made from farm wastes, including corn cobs.

Science News Letter, July 29, 1950

RADIO

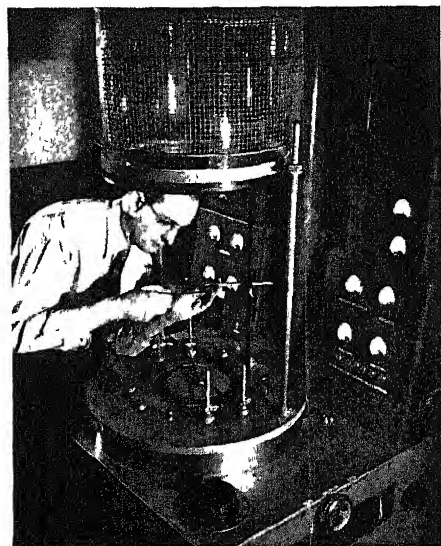
Mirrors Reflect One Color Only for Color Television

➤ MIRRORS that reflect one color only, blue, green or red, developed in Pittsburgh at the Westinghouse Research Laboratories, promise to play an important part in the color television of the future.

The mirrors are made by depositing extremely thin layers of metallic compounds on clear glass. The process is carried out by a vacuum-spray method. The glass is placed in a glass-jar "oven" from which most of the air has been removed. A special metal compound in the jar is then heated electrically. It melts and sends vapors on to the glass sheets. The vapors solidify into an ultra-thin smooth, even film.

The thickness of the films determines the particular color the mirror will reflect. For blue, the thickness may be about one-fourth the wavelength of blue light, or about 16 millionths of an inch. For green, the layer is only slightly thicker. Red reflection requires the thickest film.

The mirrors are for use at both ends of the television system. At the transmitting



ONE AT A TIME—This clear glass sheet will soon become a mirror that "sees" and reflects only one color at a time—either red, green or blue. Demonstrated by Kenneth L. Fromm, the mirrors will be used at both the transmitting and receiving end of experimental color television apparatus.

end they pick up the color picture from the camera and break it down into its three basic colors. These are sent in the proper sequence through the system. At

the receiving end, another set of mirrors gather in the colors and help regroup them in the color picture seen on the screen

Science News Letter, July 29, 1950

MEDICINE

Aureomycin for Lumpy Jaw

➤ AUREOMYCIN may turn out to be a cure for lumpy jaw, or actinomycosis as this cattle disease that humans get is known medically.

Four human patients with this disease have now been treated successfully with the mold drug, Dis. Leon V. McVay, Jr., David Dunavant, Douglas H. Sprunt and Miss Frances Guthrie of the University of Tennessee College of Medicine and John Gaston Hospital, Memphis, report in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (July 22).

The first patient had been sick for six months, in spite of treatment with penicillin and X-rays. When he entered the hospital he had a slightly reddened mass covering most of the right side of his face and reaching down his neck. It was exuding a yellowish pus from three places.

His diet was limited to liquids because he could not open his mouth as wide as half an inch.

He was given aureomycin by mouth every four hours and a semi-paste of the mold drug was put on the sores on face and neck.

"The response was dramatic," the scientists report.

Within two days he could eat comfortably and his slight fever had gone. He continued to take the mold drug for 28 days, by which time the swelling had gone and there was only a minimum amount of scarring over the opening where the pus had been draining. He was still entirely well six months later.

While the value of the drug can hardly be judged on the basis of only a few cases, especially in a disease which tends to recur as actinomycosis does, the Memphis scientists report the good results in the hope that other doctors will be stimulated to try it in this ailment.

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On This Week's Cover

➤ TWO coscorobas, rare birds from South America, have established another "first" for the Philadelphia Zoo by hatching out a pair of babies. Believed to be the first of their kind ever to hatch in America, the only other record of their breeding in captivity was established in England shortly before the first World War.

The coscoroba comes closer to being a "swoose" than any other bird on the earth. Some scientists have classified it as a swan and others as a goose. Still other ornithologists look upon it as a giant tree duck. The question is—what should the hatchlings be called—goslings, ducklings, cygnets (baby swans), or "swooslets"? The parent birds are of goose size, and they have snow white plumage save for the outer wing feathers which are black. Their bills and legs are pink. The new additions are very light grey with dark markings.

The coscoroba family built a nest in February, and the female laid two eggs; however one rolled into the pool and the

other was infertile. Some weeks ago they built again, and after 46 days of incubation, the young hatched out. Both parents guard the young ones jealously and shoo away the white mallards that occupy the same enclosure with them.

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Swimming during a thunder and lightning storm is not recommended; a person can be electrocuted by a charge carried by the water from the bolt striking at some distance.

SCIENCE NEWS LETTER

VOL. 58 JULY 29, 1950 No. 5

45,100 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W. Washington 6, D. C., North 2255 Edited by WATSON DAVIS.

Subscription rates 1 yr., \$5.50, 2 yrs., \$10.00; 3 yrs., \$14.50, single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925, 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N. Y. C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago State 4439.

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Question Box

ARCHAEOLOGY

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Where is the land of "Singing Sand"? p. 77.

Where is the "Nursery of Man"? p. 74.

BOTANY

What is the plant which may be a new raw material for licorice? p. 73.

GEOLOGY

How long will a man-made lake last? p. 71.

ORNITHOLOGY

What kind of gull follows a ship from shore to shore? p. 78.

ZOOLOGY

What is the age of the oldest seal? p. 70.

Photographs: Cover, Philadelphia Zoo; p. 67, Westinghouse Electric Corporation; p. 69, Crosley Motors, Inc.; p. 71, Bureau of Reclamation, Boulder City, Nev.; p. 80, McDonough Studios, Washington, D. C.

MILITARY SCIENCE

Use of Scientific Ability

A stop-gap program to rescue valuable scientists from mobilization is in progress. Our scientific talent must be used to best advantage.

➤ MANY of the great industrial laboratories upon which this nation depends for its scientific edge over the enemy might well be stripped of the bulk of their brightest young scientists under the present partial mobilization. Even research efforts by civilians employed by the armed forces stand in danger.

There is no government plan to prevent that now, Science Service has learned. An example of the problem is the fact that 32% of the scientists in the great Westinghouse laboratories are in the nation's military reserves.

Government officials, including those in the Defense Department who recognize the value of proper use of our scientific talent pool, and manpower experts of the National Security Resources Board are now working on a stop-gap program to rescue some of these valuable scientists from the present partial mobilization. Other government officials hope to persuade the Selective Service System to adopt a plan which was first discussed three years ago whereby scientifically trained personnel might be used to best advantage in our defense effort.

There are two sides to the coin of scientific talent. On the one hand, some scientific personnel should be withheld from the armed forces because they can be best used in civilian jobs—as physicists were used as civilians to develop the A-bomb in the last war. On the other hand, scientists who cannot pass the physical tests set up by the armed forces can in many instances be used to best advantage in uniform behind the lines.

There are at present more than 2,000,000 men and women in the nation's military reserves. Those who know—scientists and manpower specialists—say that a significant proportion of our scientific talent is among those 2,000,000. The danger is that many of those young scientists are in the reserves for the wrong reason. Some of them were in a college ROTC unit and there received training and classification in military fields unrelated to their scholastic specialties.

Others hold reserve commissions based on their World War II experiences and now have gone far beyond that to achieve their Ph.D.'s in fields more useful to the defense effort.

We have only now begun to fill to an adequate level the scientific talent reservoir which was drained by World War II. In 1950, for the first time since the war, there is one job for every graduating Ph.D. Two years ago there were approximately six

jobs for every newly made Ph.D. It must be remembered that this scientific reservoir has only been filled to a level adequate for peacetime.

Government manpower specialists and leading scientists outside the government—even while a stop-gap plan is only now being formulated—hope the government will provide a long term program for the proper

ENGINEERING

Dual-Purpose Vehicle

➤ A NEW vehicle that does the work of a light tractor, but which can be used on the highway for business or pleasure driving, was revealed in Cincinnati, Ohio, by Crosley Motors, Inc. It is designed particularly for small farmers who can not afford separate farm tractors and road cars. On the highway, it can travel up to 60 miles an hour.

As a farm tractor, it can be used to plow, cultivate, saw wood, spray crops or to pull a trailer wagon. For the highway the standard equipment includes a two-passenger main body to which a quickly attachable pick-up body may be added for additional passengers or for cargo.

utilization of our scientific personnel. They see a need for:

1. A method of taking away from local selective service boards and putting in the hands of a competent national board the decision whether scientists and students of science shall be inducted in the armed forces.

2. A method, on the national level, of allocating scientists in the military reserves to the jobs, military or civilian, where they will best help the national emergency effort.

3. A method, planned and carried through by men who understand science's role in these days of a most scientific war, of allocating the nation's scientific talent where it will do the most good.

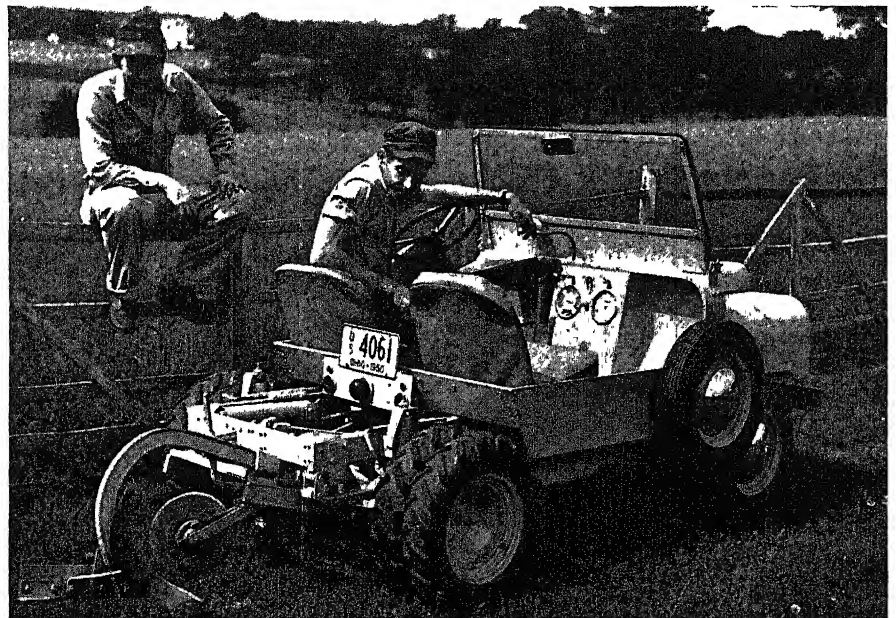
None of these has yet been done.

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Two factors of importance in this new Crosley "FarmOroad" is its small size and its low price. In general appearance, it resembles somewhat the front part of the familiar military jeep. Its wheel-base is only 63 inches. With top and windshield down, it is 45 inches high. It will sell for approximately \$800 at the Marion, Ind., factory where it is made.

This tractor-roadster weighs only 1100 pounds but has power enough to pull a ten-inch plow through tough soil. The secret of this is its 265-horsepower Crosley engine and special gear system. It has six speeds forward and two in reverse.

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DOUBLE DUTY—This versatile vehicle is an answer to the farmer's need for a machine that will do a light tractor's work and provide transportation too. This photo shows a 10-inch plow mounted on a hydraulic lift. Harrow, cultivator and other implements are also available.

MEDICINE

Hormone Upset in Cancer

An upset in the body's hormone balance may be one of the chief causes of cancer. The steroid hormones are the ones which are thought to affect the growth of tumors.

➤ AN upset in the delicate balance of the hormone system of the body may be one of the causes of cancer.

This is the opinion of a majority of the cancer experts gathered at an international meeting at the Ciba Foundation, London, to exchange views on the effects of the steroid hormones on the growth of tumors. The steroid hormones include sex hormones, as well as those of the adrenal cortex.

Tumors caused by an upset hormone balance included:

Mammoth tumors of the pituitary glands in mice injected with female sex hormone.

Lymph gland cancers in castrated mice painted with female sex hormone.

Cancerous growth of ovarian tissue implanted in the spleens of castrated mice, in which the pituitary gland churns out excessive amounts of ovary-stimulating hormone.

No tumors formed in old mice, in which hormone balance between the pituitary and ovaries was maintained despite castration because of the reduced functioning of the senile pituitary.

Sex hormones affected the growth of chemically induced prostate tissue cancers planted under the skin of mice. Addition of female sex hormone to the chemically treated prostate tissue doubled the cancer

rate. Adding male sex hormone reduced the rate by three-quarters.

Dr. R. Hertz, of the U. S. National Institutes of Health at Bethesda, Md., pointed out the vital part played by small amounts of dietary vitamins in the hormone-induced growth of tissues. By feeding female chicks and rats chemicals antagonistic to folic acid, he could inhibit the normal growth of the genital tissue in response to injections of female sex hormones.

This growth-inhibiting power of vitamin-antagonizing chemicals holds promise of a powerful anti-cancer tool, but at present the narrow safety margin of the available vitamin antagonists makes their use in the clinical control of cancer not yet feasible.

The exact mechanism by which steroid hormones influence cancer growth is still in doubt. Prof. C. W. Shoppee of University College, Swansea, Wales, cast cold water on the theory that they may be transformed in the body to cancer-causing chemicals of the "polycyclic aromatic hydrocarbon" type.

Despite the structural similarity of the steroids to these cancer-causing chemicals, drastic physical measures, which could not be duplicated in the body, are required to effect the transformation.

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MILITARY SCIENCE

Resources Feel Speed-up

➤ RUBBER, steel and oil, sinews of military might, will be among the first U. S. strategic resources to feel the national defense speed-up brought by the Korean war.

These and other raw materials of American industry were in the background as President Truman told Congress there may be need for "substantial redirection of economic resources."

Because the United States experienced a dramatic expansion of its industrial potential in World War II, however, and has continued to expand in many fields in a booming peacetime prosperity, this country stands in greater readiness for industrial mobilization now than at the beginning of the last war.

We have synthetic rubber plants to supplement imports of natural rubber. These have already felt the speed-up. Three synthetic rubber plants are already in process of being reopened.

The nation's steel mills, now operating at

100% capacity, can turn out in one year more steel than is made in the rest of the world, including Russia and her satellites.

The President pointed to the steel industry in particular, however, in warning that civilian uses may have to be curtailed to meet military demands.

Petroleum is being pumped out of the ground in record amounts to meet the greatest demand for liquid fuels in the nation's history. Science has taken huge strides in postwar years in finding ways to produce synthetic fuels from coal and oil shales. The President made no mention of oil as a possible shortage resource. But it is among the first needs of an expanded military program.

The list of strategic and critical metals and minerals is long. In World War II, it included over 100 raw materials of the more than 5,000 needed to keep U. S. industry operating in balance.

Within the past two years the Bureau of

Mines and U. S. Geological Survey released an authoritative outline of the U. S. position in minerals.

This country is virtually self-sufficient for coal, natural gas, magnesium, molybdenum, helium, magnesite, nitrates (for explosives), phosphate rock, potash, salt and sulfur.

It depends almost entirely on foreign sources for chromite, manganese, nickel, platinum, tin, industrial diamonds, quartz crystal and asbestos. It must import from abroad part of its consumption of oil, arsenic, bismuth, cadmium, copper, iron ore, lead, mercury, tantalum, tungsten, zinc, antimony, vanadium, high-grade bauxite (for aluminum) and mica.

Which of these materials of industry, both in peacetime and war, may come under allocation and control, was not revealed by the President in his message to Congress. But the outlook is now clear: military needs and production, involving nearly all of these materials, carry top priority.

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METEOROLOGY

Hot Weather Due Over Most of Nation

➤ MOST of the nation is in for hot weather for the next month—"warmer than normal" the Weather Bureau puts it in its 30-day outlook for the period from mid-July to mid-August. The area with the greatest departure from normal will be east of the Ohio and Mississippi rivers.

Only exception to the rule will be the northern Rocky Mountain states which will enjoy cooler than normal weather.

Upstate New York reservoirs on which New York City water users depend will have to get along with subnormal rainfalls from now to mid-August. The extended forecast section's prediction for the northeast, the Middle Atlantic States and Gulf states is subnormal rainfall.

This means, also, that the nation's dust-bowl areas will continue to have a less than normal amount of rain. The Rocky Mountain and northern plains states, however, will have abundant showers, equaling or exceeding normal amounts.

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ZOOLOGY

Oldest Gray Seal Known Lived Four Decades

➤ A RECORD age for the gray seal, which is found in the Atlantic, is believed authenticated at 41 to 42 years by Colin Matheson, zoologist of the National Museum of Wales at Cardiff. Following reports of seals that lived to be over 30 years old, a record was located in Sweden of a gray seal caught when a few months old and finally died in captivity in the Skansen Zoo over 41 or 42 years later. This was reported in NATURE (July 8).

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NUTRITION-ECONOMICS

From Now On: Food Race

Will growing population outstrip our food resources in the future? Application of technological advances in backward areas will be necessarily slow.

By WATSON DAVIS

Eighteenth in a series of glances forward in science.

➤ IN this year of the census taker, the experts do not have any too much curiosity about the general results of the present United States census. We know that there are about 150,000,000 men, women and children in this country.

Far more important to us, in one respect, would be an accurate count of people in other parts of the world. We know the number of people in China and even in Soviet Russia in the most general terms with errors that amount to many millions of population.

And the rate of increase for the future, the balance between life and death which will be created by changing world conditions in the next decade, constitute a gigantic question mark. In one sense the future population of the world, determining whether we shall have enough food to feed the people of the future, is a problem of the same order as atomic bombs.

For the United States, the best opinion of population experts is that in the year 2000 our population is likely to be under 200,000,000 and that if we do not reach a peak in population in the next 50 years we shall do so shortly thereafter. This is what is likely to happen if the population trends continue as they are and as we expect them to be in the future. There is also the proviso that atomic warfare will not wipe out overnight some 40,000,000 of our population as it could.

There are some unconventional statisticians who foresee a much larger population in the next 50 years, even as much as 300,000,000, but the general opinion is that with increasing population density and inevitable limitations upon food supply, our population will level off and not go on increasing at the same rate.

In the race between food and people, the problem is that of too many people, as well as too little food. Bad living conditions and the prevalence of disease often neutralize with increased death rates the higher birth rates that occur among non-industrialized populations.

Give the people more food. Save them from death through introduction to medicine and sanitation. Bring them the benefits of more advanced civilization. The population increases.

There does seem to be an eventual brake upon human reproduction that accompanies better education and better living conditions,

even though the practice of birth control is not publicly condoned or encouraged.

Under the world's systems of government, whether they be democracies or dictatorships, there seems to be a continual push for larger numbers of peoples. The dictator cries for more people to defend the homeland. The minorities in a democracy are likely to wish to grow by pure increase in numbers into majorities.

The biological urge, when it is not thwarted by semi-starvation, has a tendency to always increase the population of the earth. The next generation has a great debt to love. In terms of the whole world, some 55,000 new human beings must have breakfast every morning. The total number of people in the world is something like 2,200,000,000.

This figures out that the world's population is rising at the rate of about 200,000,000 every decade, which means more people are added to the world each decade

GEOLOGY

Silt Deposits Studied On Man-Made Lake

➤ SCIENTIFIC teamwork has provided a definite and encouraging answer to a question which has long troubled westerners—how long will man-made Lake Mead last?

Scientists from the Navy, several government bureaus, universities and private institutions studied and surveyed for two years to find out that it will take until the year 2225 and perhaps longer for Lake Mead, behind Hoover dam, to fill up with silt.

In addition, dams to be built upstream will, by catching some of the silt, extend the useful life of Lake Mead much longer.

The case history study of Lake Mead, said Secretary of the Interior Oscar L. Chapman, "exposed many uninformed estimates of Lake Mead siltation as extravagant and groundless."

One conclusion drawn by Interior officials from the study of Mead and other reservoirs was that the reservoirs would far outlive the period in which they are expected to pay for themselves.

The Navy used sounding equipment developed during the war to measure the extent of the deposits of silt on the bottom of Lake Mead. Long cores of silt from the bottom were examined by the scientists of the U. S. Geological Survey.

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than now exist in the United States.

Little wonder, then, that scientists and statesmen alike are as worried about the great population explosion that is occurring here on earth quite as much as they are about the atomic situation. Communism in Asia is more of a symptom than a cause when the food and people situation of that continent is considered. Terrible as it may be to well-fed Americans, the sheer inability to feed 5,000,000 to 10,000,000 Chinese in the near future, resulting in their deaths by famine, promises to have an effect upon the Asiatic political situation that could not be caused by force of arms.

For a world so compounded of people and the food they need, in the future we must look to.

A. A continuance of the race between people and resources of the world with the assurance, from history, that not for long will superfluous plenty be unused by increasing population.

B. The population problem is basic to the dilemma of war or peace in the future. Motivations and technical progress that can control the population spurt may be capable of avoiding the rush to human slaughter that is war.

C. Today's new applications of technological advances in scientific discoveries may double or quadruple the world's resources of food and energy, such as the discovery of how to industrialize photo-synthesis. Yet the application of such research progress will inevitably be slow in reaching the world's backward areas. Population promises to outrun potential plenty.

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UNTIL 2225—Navy divers went to the bottom of Lake Mead—the nation's biggest reservoir—to bring up samples of silt carried into the lake by the Colorado River. Experts think it will take until 2225 and perhaps longer for Lake Mead, behind Hoover Dam, to fill up with silt.

MEDICINE

Operation for Varicose Leg Ulcer 84% Successful

➤ AN operation for varicose ulcers of the legs which has been successful in 84% of the patients was reported by Dr. Gunnar Bauer of Mariestad, Sweden, at the meeting of the British Medical Association.

The operation consists in cutting the main deep vein in the back of the knee to block backflow of blood down into the leg.

"After this operation," Dr. Bauer stated, "the calf muscle contractions drive the blood through numerous fine-caliber channels into the muscle veins of the thigh, and no backflow can occur."

In normal healthy persons, the calf muscle contractions can drive the blood back through the big veins of the leg. But in some patients the valves of the big veins have been destroyed and every relaxation of the calf muscles allows the blood to flow back down the main veins, Dr. Bauer explained.

This results in permanent stoppage of blood and overloading of the veins in the lower leg. Pain and ulceration follow.

The operation devised at Mariestad Hospital has been performed 245 times with no deaths and no complications. Of 196 patients examined six months to three years later, 165 had remained healed without symptoms of blood stoppage in their legs. In 31 patients, symptoms recurred at intervals.

Science News Letter, July 29, 1950

AERONAUTICS

Jet Engine Exhaust Flame Temperature Measured

➤ THE heat of the consuming flame that shoots from the nozzle of a jet engine or rocket can now be measured with the help of infrared radiation. The flame's temperature is recorded by sending infrared rays through it into an instrument which measures radiant energy.

The method can be used to measure the temperature of flames five feet in diameter reaching 5,000 degrees Fahrenheit. It is a development of Industrial Scientific Company in New York, revealed in the Perkin-Elmer Instrument News, by Dr. W. S. Tandler, director of the scientific company.

Present and future uses of turbojet engines, ram-jets and rockets make it necessary to be able to determine the temperature of their exhaust flames. Jet engine efficiency depends largely upon the operational temperatures. Efficiency increases as the temperature rises. But the temperature used must be below the melting points of materials of which the engines are made.

The new method uses what is called an Infrared Monochromatic Radiation Pyrom-

eter. Infrared radiation from source of known emission strength is passed through the discharge flame whose temperature is to be measured and into an infrared monochromator. This is an instrument to measure and record the radiant energy of certain wavelengths.

The wavelengths used in this process are those characteristic of water or carbon dioxide in the near infrared, since these are products of combustion in any gas stream. The device is rapid and accurate, it is claimed. A major part of the program under which it was developed was carried out under contract with the Air Force Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio.

Science News Letter, July 29, 1950

GENERAL SCIENCE

Science Foundation Members to Be Named

➤ THE FIRST 24 members of the policy-making Board of the National Science Foundation are expected to be named by President Truman for Senate confirmation very soon. At least one woman will be among those named to the governing body.

Scientists recall the words of the President when he signed the legislation setting up the Foundation: "It can make as great and vital contributions in case of national emergency as I fully expect it to do for us in peacetime pursuits."

The Budget Bureau's request for \$475,000 to operate the Foundation for its first year is now being considered by the House Appropriations Committee. Original legislation authorized \$500,000 for the first year's operation.

Science News Letter, July 29, 1950

INVENTION

Recoilless Gun Has Little Kick

➤ RECOILLESS gun, a one-man military weapon which will fire a two-pound shell with no greater "kick" than an ordinary shotgun, brought an Army man a patent among the 930 issued in a recent week by the U. S. Government.

In use, it is fired like an ordinary gun with the butt against the shoulder. Its lack of kick is due to a gas "take-off" that is fixed over an opening in the side of the cartridge chamber. This is an elbow funnel affair that carries the exhaust gas back beyond the shoulder of the user. The take-off attachment tapers to the rear, and has a special nozzle on its end.

Maurice E. Barker, U. S. Army, received patent 2,515,180 for this invention. It may be made and used by the government without the payment of royalties.

Science News Letter, July 29, 1950



GEOPHYSICS

Far East Typhoons Cradled By Marshall Islands

➤ THE Marshall Islands area in mid-Pacific is the "cradle" of typhoons that, as they mature, move west and north toward the Philippines, China and Japan.

Long suspected, this fact has now been definitely established by the Tropical-Pacific Project of the University of California at Los Angeles' Institute of Geophysics.

Under the direction of Dr. Clarence E. Palmer, the research is based upon weather observations taken during Operations Crossroads and represents one of the first important non-military results to come from the atom bomb tests at Bikini.

Another result of the research is this: typhoons and hurricanes are born in the same way. Previously it was thought that Caribbean hurricanes and Pacific typhoons were the result of two entirely different types of meteorological phenomenon.

The U. C. L. A. scientist points out that the research on typhoons indicates how little is known about the great tropical "weather factory" of the Pacific. Since more than one billion people are affected by weather originating in the tropics, there is urgent need for more studies in this area.

Science News Letter, July 29, 1950

MEDICINE

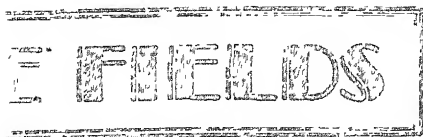
New Streptomycin From Japanese Soil

➤ DISCOVERY of a new streptomycin from an organism in Japanese soil is announced by five scientists of the Department of Agriculture's Northern Regional Research Laboratory in Peoria, Ill.

The new streptomycin has anti-germ action like streptomycin itself, test tube trials show. Its discoverers suggest that its name be hydroxystreptomycin. It was obtained from a new species of the streptomyces organisms which produce streptomycin itself. For this organism, the scientists suggest the name *Streptomyces griseo-carneus*.

Search for streptomycin-like substances that would be as effective against disease germs but less toxic than streptomycin and to which the germs would not grow resistant led to the discovery of this new streptomycin. Details of its chemical makeup are reported in the journal, SCIENCE (July 21), by the discoverers, Dr. Robert G. Benedict, Dr. Frank H. Stodola, Dr. Odette L. Shotwell, Anne Marie Borud and Lloyd A. Lindenfelser.

Science News Letter, July 29, 1950



MEDICINE

Thiourea Shots Prevent Radiation Death

➤ SHOTS of a chemical called thiourea will protect mice against radiation death, Drs. G. Limperos and W. A. Mosher of the Biochemical Research Foundation and the University of Delaware in Newark, Del., find.

When a group of mice was given this chemical by injection before heavy doses of X-rays, over a third (35.2%) of the animals survived, compared to less than one-tenth (7%) injected after irradiation and only two percent of control animals irradiated but not given the chemical.

Thiourea has been used as a medicine to check over-active thyroid glands in some goiter patients.

The Delaware scientists believe it lowers mortality due to X-radiation because of the protection it gives to certain vital constituents of body cells, such as nucleic acid. Whether it will lessen the remedial effects of X-rays besides reducing the mortality remains to be investigated, they state in their report to the journal, *SCIENCE* (July 21).

Science News Letter, July 29, 1950

MILITARY SCIENCE

North Korean Supply Routes Vulnerable

➤ IF American bombers knock out the Japanese-developed North Korean industrial plant, problem of replacement of planes, tanks and guns for the Reds might become difficult.

North Korean factories are perfectly capable of turning out much of the heavy equipment now being used by the Communist armies, Prof. George B. Cressey, of Syracuse University and expert on the Far East, told Science Service. But, he added, there is no heavy industry for 1,500 miles between North Korea and Lake Baikal in Siberia.

"Once stockpiles are exhausted, and if our bombers destroy the North Korean industrial potential," he said, "the Russians will have to transport new supplies over Siberian and Manchurian railroads from centers of heavy industry east of Lake Baikal."

That is about 1,500 miles from the North Korean-Manchurian border.

Although there is a short stretch of Siberian-North Korean border, Prof. Cressey pointed out, there is no railroad between Soviet and North Korean territory which does not pass over Chinese Manchuria.

Russia has the choice of three rail routes

into North Korea. One is the double-tracked Trans-Siberian railroad to Vladivostok. Another is the Manchurian route through Kirin to the 20-year-old port of Rashin in northeast North Korea. The third is through Mukden to western North Korea. All three are modern roads, although the latter two are probably single-tracked into North Korea.

The Japanese, who occupied Korea from 1905, extensively developed the North Korean heavy industry and it became an important arms arsenal for the Japs during World War II. There are good deposits of iron and coal in the territory north of the 38th parallel.

Whether the Communists will begin to have supply difficulties probably depends on the estimate made of the ease with which South Korea could be conquered and, therefore, on the size of equipment stockpiles in North Korea, Manchuria and eastern Siberia.

Manchuria cannot be depended upon to supply much to the North Koreans. Russia destroyed Manchurian industry when she withdrew from there after World War II. Little heavy industry has been developed in eastern Siberia, according to Prof. Cressey.

Science News Letter, July 29, 1950

PHYSICS

New Battery Operates At 65 Degrees Below

➤ A NEW type of wet-cell battery using magnesium and cuprous chloride in place of the familiar lead plates and sulfuric acid has been developed by the Army Signal Corps.

Designed to power radiosonde instruments which weathermen send up for high-altitude meteorological research, the first models of the new battery weigh less than a pound, will operate at temperatures down to 65 degrees below zero and take up only 16 cubic inches. They can be activated by ordinary tap water, and will deliver 12 watt-hours of power.

Science News Letter, July 29, 1950

NUCLEAR PHYSICS

AEC to Issue Report On Atomic Weapons

➤ A NEW "Smyth report" on the effects of atomic weapons, understood to be "the first completely authoritative document on the over-all effects of atomic weapons," is being compiled by the Atomic Energy Commission and will be sold by the Government Printing Office about August 1.

The use of radioactive material as a weapon and "radiological warfare" will be covered. Hitherto unpublished details about the shock waves resulting from atomic bombs are promised.

Science News Letter, July 29, 1950

PHYSICS-BIOLOGY

Electrical Ear Studies Whispers or Shrieks

➤ WITH an electrical model of the human ear, scientists are studying the softest whisper and the loudest shriek you can hear. How the ear works is described in strange formulas and mathematical symbols in a new theory being worked out.

A maze of wires, inductors, capacitors and voltage meters has been designed by two Bell Telephone mathematicians, Drs. B. P. Bogert and L. C. Peterson, to reproduce the workings of the inner ear.

This inner ear, or cochlea, is a snail-like spiral tube filled with fluid. Its job is to transform sounds that strike the ear drum into electrical impulses. Thousands of tiny nerves lead these impulses to the brain. The cochlea sorts out the many frequencies which may make up a certain sound, the brain puts them back together again.

The electrical network designed at Bell Laboratories in Murray Hill, N. J., simulates this mechanical action of the inner ear. It sorts out the frequencies of sounds entering the system, causing them to appear at different points along the network.

Results from studies with the new instrument are published in the *JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA* (May). The goal, says Drs. Bogert and Peterson, is a more complete understanding of the dynamics of the cochlea. In simple terms, mathematics is giving a better conception of why and how a noise is a noise.

Science News Letter, July 29, 1950

ARCHAEOLOGY

Mammals in Texas 100,000,000 Years Ago

➤ FIRST evidence of mammals living in this country in a prehistoric age which began about 100,000,000 years ago has been found in northern Texas.

Two fossil hunters from the Chicago Natural History Museum, Drs. Rainer Zangerl and Robert H. Denison, uncovered jawbones of a family of small mammals known as triconodonts. The discovery was made in a geologic deposit known as the Early Cretaceous Trinity Sands of Montague County, Texas, north of Fort Worth, and reported in the journal, *SCIENCE* (July 14).

The only other known mammalian remains of this age are five isolated teeth found in southern England. Until now, triconodonts were known from fossils tens of millions of years older than the recent finds.

Museum officials are planning intensive investigations of the Trinity Sands area, hoping to find remains of other mammals which may throw light on the development of present-day animals.

Science News Letter, July 29, 1950

ANTHROPOLOGY

Search for Missing Link

An anthropological expedition spends three months in Lebanon, Syria, Iraq and Iran, the area known as "the nursery of man." This is an exclusive coverage.

By DR. HENRY FIELD

► BEIRUT, LEBANON—Is there a true "missing link" to be found in Iraq along the path ancient man first followed from Asia to Europe and Africa?

What has happened to an ancient "lost city" visited only once before in modern times—in 1928? This mass of ruins is also in Iraq, near Kish. When I was there 22 years ago, I became so sick from the desert heat that I could make no explorations.

These are only two of the questions being pursued on a three months expedition along the trail through Lebanon, Syria, Iraq and Iran which was followed by the first ancestors of western man.

Our party which includes Robb White, noted newspaper man, expects to travel thousands of miles, by jeep and Plymouth Suburban across the desert. We have 10 major objectives along the way and at all those places we hope to find things which will add to our knowledge of prehistoric and modern man.

Much of our work will be done between the storied Tigris and Euphrates rivers, an area that once was incredibly rich and fertile. It will be hard work, hot and dirty. It will involve digging in dank and dirty caves, painstaking measurements of living people and long hot rides over the dusty deserts.

Prehistoric Man Was Here

ABOU KEMAL, SYRIA—The Peabody Museum-Harvard University Expedition to the Near East has discovered distinct settlements of stone age or Paleolithic man in this area. Along a northeasterly line from Damascus to the Euphrates river we found 10 places where prehistoric man once lived.

This discovery adds more evidence to support our theory that at one time, millennia before recorded history, this part of the great Syrian Desert was a watered and fertile plain. The flint scrapers and lance heads which were found show that animals must have been plentiful and could be killed with enough ease by the human inhabitants to provide them with food. The discovery of flint handaxes seems also to show that there were trees here where, today, there is only arid desert.

The most interesting of the sites found was on an escarpment overlooking the Wadi Rutga in northeastern Syria. Today man could not survive long on this stony ridge beside a dry and barren stream bed.

However, at one place here, where the

evidence of flint could be seen by flashes of sunlight from the smooth surfaces, prehistoric man must have lived in, for him, great comfort. An abundance of flint provided him with the tools and weapons he needed and a fine assortment of handaxes, choppers, scrapers, knives and flakes were found. Twenty thousand years ago a stream probably flowed in the wadi, and the low slopes were no doubt covered with vegetation.

The discovery of these 10 settlements across the Syrian Desert provides strong evidence to support my theory that prehistoric man used this area as a main route for his migration between Asia, Africa and Europe. For many years the Syrian Desert, desiccated and almost barren, was considered by scientists as a natural barrier to migration similar to that of the salt desert in Persia. However, this discovery of ancient settlements provides further evidence that, in Paleolithic times, the desert was in fact not a barrier at all but a logical area across which to migrate westward to the Mediterranean.

For this part of its itinerary, the expedition had as a temporary member J H Keeley, U S Minister to Syria. Mr Keeley made a most fortunate "find" of what appears to be a remnant of prehistoric carving.

Surrealist Animals and Mounds

DEIR EZ ZOR, SYRIA—With permission of the Syrian authorities, the Peabody Museum-Harvard University Expedition to the Near East was allowed to enter the restricted zone around Hassetché in northern Syria. Accompanied by a member of the Syrian police, who was armed with a sub-machine gun, the expedition travelled from Deir ez Zor beside the Euphrates to within sight of the Turkish border at Ras el Ain.

Tell Halaf, one of the most important sites in western Asia, was inspected and the marks of Baron Max von Oppenheim's work were still to be seen. Baron Oppenheim spent many years here laboriously excavating huge stone figures of fantastic animals which would probably be called "surrealist" by moderns. These statues were shipped to Oppenheim's private museum in Berlin only to be destroyed, as the remnants of Babylon were, by bombing in 1944.

The village of Ras el Ain is a pleasant, stone-built town inhabited by Arabs, Turks and Chechens. Water is abundant as there are about 200 bubbling springs which form

the headwaters of the Khabour river. On both sides of the Khabour, we found many grass covered mounds littered with potsherds. Also along the Khabour are the curious villages of about 8,000 Assyrians who were settled in this region by the League of Nations. Their houses are shaped like overgrown conical beehives and are made of mud. These Assyrian refugees appear to be living in some happiness in this healthy but isolated region of the world.

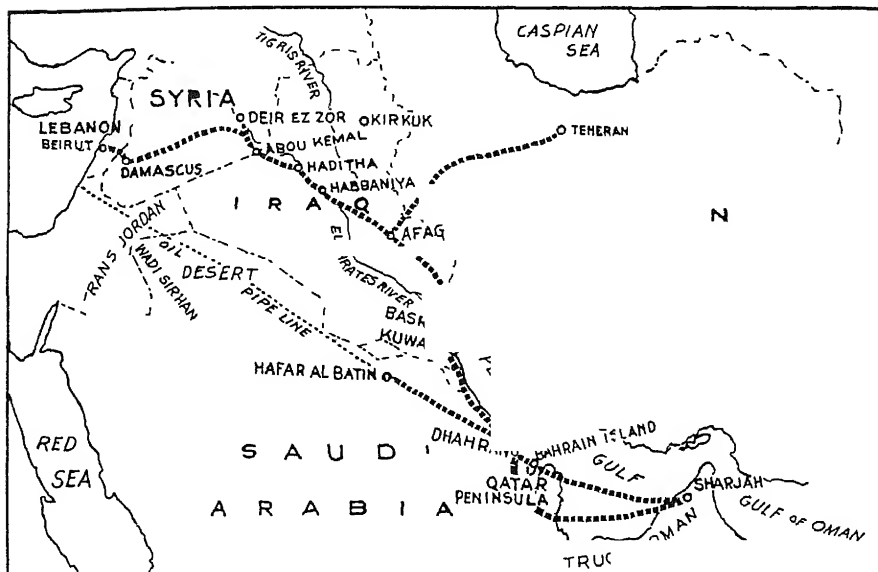
Physical Measurements Taken

HABBANIYA, IRAQ—The origin of the modern Assyrian has long been a puzzle to anthropologists. One of the primary objectives of our expedition to the Near East is to find evidence of this origin and to determine, if possible, whether the present day peoples are descended from the famed Assyrians of ancient times.

In 1934, we took anthropometric records of a group of Assyrians but the measurements were made under most difficult conditions. When the results were tabulated the data were found to be in too great conflict to be used as a basis for determining any origin by comparison. Recently, however, in Habbaniya, conditions for making a new series of measurements were ideal. Here, at this large Royal Air Force base,



LEADER OF EXPEDITION—Dr. Henry Field, leader of the Near East exploration, was formerly associated with the Field Museum of Chicago. He is the first anthropologist in modern years to be allowed to visit Saudi Arabia.



HIGHLIGHTS OF EXPEDITION—The Peabody Museum-Harvard University expedition on an exploration of the "Nursery of Man" visited the various places, as shown by the heavy dotted line, in the countries of Iran, Iraq, Syria and Saudi Arabia. Long known as the crossroads area where stone age people must have lived, few traces of them have hitherto been found and no adequate search for prehistoric man has hitherto been made in this region.

Air Vice Marshal J N Boothman provided us with 531 Assyrians who were working there as levys. Under military discipline measurements could be quickly and accurately made.

Fortunately, this group of Assyrians were from tribes including the Upper and Lower Trujari, Boz, Diz, Tkuma, Jelu and Marbishu. This provided a good cross-section and enabled us to get much information from the men as to their tribal origin and history. (Some of them were much more interested in the welfare of their relatives in Chicago).

A somewhat confusing characteristic of the typical round-head Assyrian is the flattening of the back of the head. This is caused by the custom of strapping the children into a cradle from birth continuously for the first two years of their lives. The pillow under the head grows progressively harder thus artificially deforming the back of the head. The reasons for thus confining a child seem to be, in the main, two first, it forcibly prevents the child from crawling about and being a nuisance and, second, there is a superstitious belief that it keeps away evil spirits. This deformation seems to have no ill effect on the mentality of the Assyrians, their heads growing broader in compensation.

We hope that, when this new series of measurements are tabulated at Harvard, new light will be thrown on the original source of these persecuted people.

There was some concern on the part of many of the levys as to the welfare of their 8,000 compatriots who were settled by the

League of Nations in a remote part of Syria. Since the Expedition had recently visited these villages along the Khabour river we could assure the men that all was well with their friends.

Sand Covering Babylon, Kish

AFAG, IRAQ—This mud brick and sun-baked Arab village provided a meeting place for two U.S. expeditions—that of the University of Pennsylvania, led by Dr. Don McCown, and our Peabody Museum-Harvard University Expedition to the Near East.

We, along with Dr. Faraj Basmachi of the Iraq Department of Antiquities, drove down from Baghdad, stopping on the way at Babylon and Kish, and spending some time in search of a "lost" city east of Hilla.

The ruins of Babylon, slowly filling in again with blowing sand, were doubly sad when it was remembered that the treasures of this fabulous and beautiful city are now gone forever. Excavated by the Germans in the early 1900's, almost everything of value was shipped to Berlin. There the city of Babylon was reconstructed almost in its entirety only to be finally destroyed by the air raids on Berlin in World War II. What has become of the famed Ishtar Gate and other remnants is not known although there is a rumor that the Gate survived the bombing and was removed later to Russia.

We also visited Kish. Here, too, blowing sand is rapidly obliterating all traces of this city—according to legend the first founded after the Flood—and it will soon

be only a barren mound rising from the desert floor.

While on the Kish expedition in 1928, Eric Schroeder and I made an exploratory trip between the Tigris and Euphrates rivers. We found a low and unidentified mound surrounded by ruined buildings and with many potsherds scattered about. At that time the going was slow as we both were travelling by horseback. Now the same trip was made again but this time by jeep which, while somewhat more uncomfortable than a horse, was swifter and equally able to climb in and out of the ancient irrigation ditches.

Aid in re-discovering the "lost" city was also given by Air Vice Marshal Boothman who kindly flew down from his base at Lake Habbaniya and circled a low mound topped by a rectangular ruin rising from a perfectly arid waste of desert. Since 1928, however, this mound had been identified by the Iraq Department of Antiquities as Tel Abou Hatab and had been found to be of more or less recent Islamic origin.

Here at Afag the two expeditions met and Dr. McCown invited us to visit the excavation going on at Nippur, some six miles out in the desert from Afag. We were shown the remains of the city and the ziggurat (or temple) and many of the relics taken from the site, including some small gold trinkets and rings and small statues in both stone and ceramic.

Implements Found

TEHERAN, IRAN—Men of the Old Stone Age lived in the caves of Luristan in western Persia.

The first proof has been obtained by our Peabody Museum-Harvard Expedition. Three caves near Khurramabad were studied.

Konji cave, which stands midway up a 1,000 foot limestone mountain, overlooks a vast green plain cut by a meandering river. Snow covered slopes form a continuous range across the valley. This is indeed an ideal location.

Flint implements and flakes made by hunters of the Old Stone Age were found in a small trial trench just inside the cave entrance.

On the slopes outside two other caves in nearby valleys, we also found flint flakes indicating prehistoric inhabitation.

It may now be said with certainty that Paleolithic Man lived in Luristan, famous previously for its mountains, fierce tribesmen and superb ancient bronzes.

I believe that ancient man migrated from Central Asia southward along the eastern border of Persia, then turned northwest through the pleasant valleys of Khuzistan and Luristan until the passes of Sulaimaniya, Aqra and Rowanduz led onto the Mesopotamia plain.

We returned to Baghdad to make preparations for excavations at Baradost cave above Rowanduz Gorge in northeastern

Iraq. Here it is hoped to find another link in the chain of evidence for Stone Age cultures now extending from southwestern Sinai, the wilderness of Jordan and the North Arabian or Syrian Desert.

5000 B.C. Pottery Found

KIRKUK, IRAQ—During excavation of a nine-foot sounding trench in Diana Cave high on Baradost mountain in northeastern Iraq, painted pottery with incised designs of Tell Hassuna type has been found.

This pottery, previously known from the northern plain of Iraq and attributed to the period of about 5,000 B.C., must have been used as an article of trade into Kurdistan about 3,000 years before Abraham lived at Ur of the Chaldees.

The pottery was identified as of Tell Hassuna type, which will later be studied with the remainder of the sherds and animal bones in the Iraq Museum in Baghdad.

Diana Cave, located about 3,500 feet up on Jebel Baradost, faces east over a narrow, rocky valley. A pile of snow covered the approach down the slope from above. Native hunters were sent out to supply fresh meat.

Work has been transferred to the Pastoun Cave about a quarter mile to the east.

Bear Is Main Diet

BARADOST MOUNTAIN, IRAQ—Members of the Peabody Museum-Harvard University Expedition to the Near East have been dining for some time on a dilapidated bear.

The party climbed up the Baradost mountain to search in the caves there for traces of prehistoric man.

Since it took the best part of the day to go by mule back and on foot up the mountain in the wildest part of Kurdistan, shopping for food was somewhat difficult. However, the expedition confidently expected to have a steady supply of fresh meat furnished by the expert Kurd marksmen. We were assured that there would be no lack of gazelle steak, ibex shish kabab, quail and grouse.

Instead, for three days the hunters combing the still snow covered mountains found nothing. The members of the expedition were forced to live on what few cans of food there were and the paper-thin slabs of Kurdish bread. This diet was rather meager for men engaged in searching the lower reaches of a huge cave and excavating the entire front of it.

On the fourth day luck turned. Adu David, an Assyrian, returned from the day-long hunt with one large bear. None of the scientists was expert in determining the age of bears, but this one seemed to be well along in the normal life span of such animals. The teeth were yellow and considerably worn, some being entirely missing. The fur was somewhat spotty and several toes were gone, but the bear appeared to be edible.

The cook sliced the meat very thin and skewered it on kabab spikes. He then

cooked it over an open fire and served it on the spikes to the hungry members of the expedition.

By the time the bear was consumed a consensus determined that the meat of that particular bear at any rate was tasty. The degree of toughness was comparable to that of a rubber boot and it was very close to indigestible.

Fortunately for the health and welfare of the scientists more concentrated hunting brought in two ibex to relieve the monotony of bear meat and a supply train of one donkey and a small Kurdish boy was organized. This returned with chickens of the same vintage as the bear and eggs somewhat younger.

Skull and Bone Series Collected

HADITTA ON THE EUPHRATES, IRAQ—Deep in the hidden recesses of a cave which was the home of wolves or hyenas, we found bones, bones, bones, thousands of animal bones—and a few human skulls.

While we examined the bones and the skulls, one member of our Peabody Museum-Harvard expedition stood guard, armed with the thighbone of a camel, in case the residents of the cave showed their resentment by charging us with bared fangs. Wolf footprints were large and clear in the dry dust and in one corner of the cave some fresh meat attracted a swarm of ants.

We reached the cave by wriggling uncomfortably through a narrow rocky tunnel. The air inside was dry and musty, the atmosphere hot, dusty and fetid, rank with the smell of the animals for which this cave was home.

A fine series of skulls and bones of camel, horse or donkey, wolf, hyena, jackal, fox, sheep and goat were collected and carried with great difficulty through the tunnel to the small entrance.

Several fragmentary human skulls and a few mandibles were also found. Four of the skull fragments were heavily mineralized and abnormally thick.

Could these be the skulls of the prehistoric hunters for whom we had been searching? Were they brought in by ravenous wolves or hyenas as a special delicacy? These questions may be solved by chemical analysis at Harvard, where they will be shipped on loan for study.

Examination of three skull caps revealed possible stone knife marks on the edges. This is reminiscent of the Magdalenian skull cap from Le Placard in France which is believed to have been used as a ceremonial drinking cup.

After two hours below ground we were glad to crawl upward to daylight—and fresh air.

Assyrian Belles Measured

HABBANIYA, IRAQ—Blonde, blue-eyed or gray-eyed women with peaches and cream complexions—these and their older,

more thick-set friends, submitted to measurements and physical examinations here—all in the interests of pure science.

The Peabody Museum-Harvard Expedition secured statistics on 126 women and 530 men, young and old Assyrians in this Civil Cantonment of the British Royal Air Force. With measurements of stature, sitting height and observations of the head and face, it should be possible to determine the racial position of these men and women among the peoples of Southwestern Asia.

As they passed through the assembly line, observations were also taken of their skin color, hair, eyes, noses and teeth. Medical assistants took their weight, pulse rate and respiration.

With their eyes downcast, the younger girls passed through the ordeal reluctantly but nobly, obeying orders of the R A F. But, once it was announced that they were to be photographed, they were far from reticent. They crowded around the camera, eager to get into the picture. The camera took away their shyness, and they crowded around the door and pushed and shoved to get into the room to be measured and observed.

Two days later a set of prints was delivered to them as a reward for their cooperation.

Two basic types were observed: a tall, thin, light-haired, blue-eyed or gray-eyed group, and a thick-set, round-faced, dark brown-eyed group. The Assyrian women appear to be less racially mixed than the men.

Red Ocher for Rosy Cheeks

WESTERN DESERT, IRAQ—In prehistoric times, red ocher was a girl's best friend—as rouge is today.

Far out in the desert lies the Gaara Depression 50 miles long and 20 miles wide. In the center of the depression rise five hills, with hard caps of limestone, making them visible for miles around. On Jebel-el-Afaif, whose summit is adorned with a castle-like rocky formation, the members of the Peabody Museum-Harvard Expedition found an ancient mine. Large lumps of red ocher were strewn on the surface of the slope.

Ocher is any of a class of natural earths, mixtures of hydrated oxide of iron with various earthy materials, ranging in color from pale yellow to orange and red.

Near this ancient "cosmetic" mine, crude flint picks were strewn about in profusion. This was evidently an important source of the priceless red powder used by dozens of generations for body paint.

In addition to giving life to pale cheeks, red ocher was used to assure life in the next world. Graves were believed to have been lined with the material in the hope that because it was the color of blood, it would give life to the corpse.

Red ocher, today, has slipped from a place on the cosmetic tables of the women

of Babylonia and Sumeria to the substance used for branding sheep. While we were at the mine, an Aniza Bedouin boy climbed with easy grace up the hill. He picked up several lumps of the ocher, explaining that, after powdering, water was added to form a thick red paste, which is applied to the backs of sheep as a property mark.

A sandstorm began to roll toward us from the northwest, accompanied by warning gusts of hot wind. We left the mine, and just made the camp before we were engulfed in the whirling sand.

BASRA, IRAQ—Thousands of acres of flooded area were below as the Iraqi Airways plane left Baghdad. Baghdad indeed had become an island, surrounded by the swirling brown waters rushing southward from the high mountains.

Here in 1950 was a small-scale repetition of the flood which covered lower Mesopotamia some 5,000 years ago. Noah and his kinfolk did not have the modern advantages of aerial surveys and warnings by telephone and radio. The heavy winter snowfall was melted by a quick thaw and the twin rivers—the Tigris and the Euphrates—overflowed their low banks and joined into one vast torrent sweeping all before it into the Persian Gulf.

As we flew south we passed over Kish, "the first city founded after the Flood" according to the cuneiform texts. Here I had spent two seasons excavating with the Field Museum-Oxford University Expedition. Here we had found the scientific proof of the Flood. A few miles to our east lay Babylon, its famous Hanging Gardens now a desolate waste of sand.

An hour later we passed near Ur of the Chaldees, the home of Abraham. A Beduin shepherd was leading his flock of sheep and goats to a nearby pasture. This scene was the same as that of 50 centuries ago as recorded in the Bible.

We swung westward to fly over Al Qurna, where the Twin Rivers meet to flow as one into the Persian Gulf. This is the location of the traditional Garden of Eden. Now this area is nothing but a sandy waste with a few low mounds designating former habitation.

Above the inland lake known as the Horal-Hammar, the Marsh Arabs could be seen poling their gondola-like *Mashahuf* through the tall reeds or across open water. Many of their tiny villages were precariously near to the rising waterline.

The plane swooped down onto Basra airport which was fortunately dry as a bone.

Shade Is 112 Degrees

KUWAIT, PERSIAN GULF—It certainly seemed improbable that prehistoric man, for whom this Peabody Museum-Harvard Expedition is searching, ever crossed or lived on the hot and sandy waste of this area, but even here we found crude flint flaked by human hands.

Flying over water and desert from Basra, we landed here in a blast of furnace-hot wind that swept across the landing field. In our search for traces of former habitation, we drove four miles west of Magwa to a low mound. On the summit lie two rectangular lines of dressed stones, either the foundations of small buildings or the remains of graves. Nearby on the slopes I found the stone flakes of crude flint worked by ancient man.

We searched for flint implements around a small lake of bitumen. Col. H. R. Dickson, world-authority on Kuwait, had found a good series in this region. However, drifting sand had covered the area only a few days before.

At the southern extremity of Kuwait on the border of the Neutral Zone we climbed Jebel Gurain, the twin-horned peaks visible from afar. Here we found a few poor flakes indicating the presence of ancient man, although the word "ancient" here may mean but a short span.

Black spots began to flicker in front of my eyes. I felt giddy. The wind was strong. The sunlight intense. The shade temperature was 112 degrees.

Col. Dickson, former British political agent and now adviser to the Kuwait Oil Co., has lived in Kuwait for almost a quarter of a century. He has found stone implements at three other localities. Very generously he presented the finest specimens to the Peabody Museum at Harvard. Col. Dickson and his wife are the authors of "The Arab of the Desert," a recent classic on the way of life of the Bedouin. Mrs. Dickson has collected the flora and fauna of Kuwait, so that their joint efforts form a landmark in the basic research of the Persian Gulf.

The modern population of Kuwait town is markedly different from that of Baghdad. In the market is a rare racial medley of Arabs, Persians, Baluchis, Negroes and a few hawknosed Bedouins from the great hinterland of Saudi Arabia. Here the physical anthropologist would have to select his subjects with the greatest care for his results to be worth recording.

Immense Burial Ground

BAHRAIN ISLAND, PERSIAN GULF—At least 50,000 burial mounds—tumuli, they are called—rise on the main island of Manama half an hour south of Muharriz, where we landed by air.

Local authorities suggest that Bahrain was considered as the sacred spot for burial about 3,500 years ago and that the dead were brought here from all around.

This is similar to the custom prevailing at the shrine of An Najaf in Iraq where thousands of bodies are brought annually by car, camel and donkey to be interred in the holy ground.

The largest Bahrain tumuli are 80 feet high and 150 feet around the base. Stone chambered tombs occupy the central position. Many have been opened during this century, the majority rifled. I am hoping

to obtain permission to open one tomb before leaving Bahrain. Permission must be granted by the Sheik of Bahrain.

No Stone Age traces have ever been found on these islands, the earliest evidence for occupation being contemporary with the earlier phases of the historical periods in Mesopotamia and Persia.

With regard to the modern inhabitants of Bahrain, they are even more mixed racially than the dwellers in Kuwait to the north. For here on these islands have come sailors, fisherfolk, pearl divers as well as Persians, Indians, and Baluchis and many, many others.

C. Dalrymple Belgrave, who has been Adviser to the Sheik of Bahrain for 24 years, suggested that a series of Beharna might prove of anthropometric interest for they are believed to be the descendants of the aborigines, or at any rate the first settlers, on these islands.

Hence I measured 45 Beharna men in the village of Jidd-Hafis on Manama island. They were certainly different from any of the groups I have studied since 1925 in Iraq or Iran. When the measurements and observations have been tabulated and the photographs studied, it may be possible to determine their racial origin.

Land of Singing Sand

QATAR PENINSULA, PERSIAN GULF—The village of Dukhan, a small community in the center of the western side of Qatar Peninsula, lies 40 minutes in a small six-seater plane across the water from Bahrain Island.

Here I talked with Mansur (the local chieftain) as we sipped coffee as only desert-dwellers know how to make it. Mansur is a tall, distinguished-looking Arab in his flowing robes. He dictated to me the names of the Beduin tribes and sub-tribes of this peninsula. He drew with his long forefinger a tribal map. This was the more extraordinary for Mansur was blind.

We drove across to Umin Said on the eastern side, stopping to examine a cave, 120 feet deep in the limestone. There was brackish water at the bottom. Nowhere could I find traces of ancient habitation inside or outside this cave, which long must have been a well-known landmark for water is scarce indeed in this rocky and sand-strewn wilderness.

To the south rose crescent sand dunes which move constantly. Here are the "Singing Sands" where the wind strikes a slope to cause deep moans like a giant in distress.

On the road to Doha we passed several ruined villages. One informant said that in this part of the world after a generation or two the entire population often decided to move along the coast.

The last three hours of the journey were unpleasant. The wind was hot. Dust devils swirled around the car. The scenery was unending low, rocky hills and sand. We arrived panting in Dukhan.

(Continued Next Week)

ORNITHOLOGY

NATURE
RAMBLINGS

Seagulls

► IN Salt Lake City there stands a monument to seagulls. It commemorates a critical moment in the early days of the Mormon settlement in Utah when a black cricket plague threatened to destroy the crops for the second year in succession.

Suddenly out of the blue thousands of seagulls appeared and made short work of the insect destroyers. The harvest was safe. The settlers hailed their deliverance from starvation as a miracle. In gratitude they

raised a monument to their saviors, the seagulls.

Less dramatic but more common is the miracle which never fails to impress sea-going travelers, the seagull escort following ocean liners far out in the lonely ocean.

Sometimes the first sign the voyager has that the trip is nearing its end is the appearance of gulls hovering in the wake of the ship, long before he can detect any sign of land. At the beginning of the voyage as the ship slowly left port the gulls were there, wheeling gracefully astern and ready to pounce on any edible refuse cast overboard.

Then at some point the traveler notices that the gulls are gone, that they have turned back, he realized with a thrill that he and the ship are an insignificant dot in the midst of a gigantic expanse of water. It is at this moment that he is apt to cast a glance at the ship's bridge and hope that the captain knows his business.

At least one species of gull, the common

kittiwake, sometimes makes the whole trip, following a ship from one side of the ocean to the other. Young gulls, marked in England, have been subsequently recovered on this side of the Atlantic. The only plausible explanation is that they got here by following ships.

Gulls are scavengers, feeding on refuse or dead fish. They are birds of the northern hemisphere, inhabiting coasts, rivers, and harbors. They are also to be found on large inland lakes such as the Great Lakes and the Great Salt Lake in Utah. The gulls that swooped down to the timely rescue of the Mormon settlers' crops, no doubt came from Great Salt Lake.

The flight of gulls is full of grace and skill. They can hang effortlessly in the air for hours, trimming their wings to the wind, slowly circling, scanning, waiting. Throw something overboard, and down they swiftly swoop, for whatever provender the water may yield.

Science News Letter, July 29, 1950

CHEMISTRY

Oscillators for Analysis

► HIGH frequency oscillators similar to small radio sending stations can tell the chemist how much salt is in the sea or how much of a valuable element like beryllium might be lost down the drain. This extends the principle of radio into a new field.

Scientists at the University of Wisconsin and the Oak Ridge National Laboratory have independently described instruments to follow reactions in chemical solutions by use of high frequency oscillators.

The standard method for measuring an unknown amount of material is employed. The chemist keeps adding to a small sample of the solution known amounts of a substance that will combine with it, until the unknown material is all used up. The high frequency device tells when this titration is finished.

The vessel containing the solution to be titrated is placed in the field of a high frequency oscillator while measured volumes of the reagent are added. As the chemical reaction proceeds and composition of the solution changes, the load on the oscillator changes. This produces a measurable change in plate or grid current or in frequency. If one of these quantities is graphed against the amount of added reagent, the curve has a break in it at the point where exactly enough of the reagent has been added to complete the reaction. Such a titration curve is obtained without any additions to show color changes or immersing electrodes in the solution being tested.

Several oscillators ranging in frequency from 5 to 360 megacycles have been built, but considerable development will be needed before the instruments are ready for commercial use.

The effect is believed to be due to minute changes in the capacity of the chemical solutions. Small capacitance changes will produce relatively large changes in plate current of the grid-tuned plate oscillators. At Oak Ridge the system has been used in titrating solutions containing beryllium and aluminum, elements that act either base or acid, depending upon their chemical surroundings.

Science News Letter, July 29, 1950

MEDICINE

Double Danger Faces
Pneumonia Patients

► WARNING of a new danger to pneumonia patients was issued by Dr. Thomas Anderson of Glasgow at the meeting in Liverpool, Eng., of the British Medical Association.

The danger is that doctors may be too ready to consider all unusual pneumonia cases as virus or atypical pneumonia. Unusual pneumonias due to bacteria instead of viruses are not uncommon, Dr. Anderson declared.

If the doctor does not base his diagnosis on tests that will show whether or not the cause is the bacteria kind of germ, he may fail to give the patient a sulfa drug, penicillin or one of the other modern remedies effective in bacteria-caused pneumonias. These remedies, with the possible exception of aureomycin, are not effective in virus pneumonias. Consequently doctors are unlikely to give them if they think the pneumonia is virus-caused.

Science News Letter, July 29, 1950

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ANNUAL REPORT 1949—Chicago Natural History Museum, 140 p., illus., paper, \$1.00. Includes the Museum's latest advances in the departments of zoology, botany and geology.

A BIBLIOGRAPHY IN AUDITION—Psycho-Acoustic Laboratory Harvard University—Harvard University Press, Vol. I A-M, approx. 225 p., paper, Vol. II N-Z, approx. 210 p., paper, both volumes \$3.00. An alphabetical list of references prepared by the Harvard Psycho-Acoustic Laboratory in cooperation with the Office of Naval Research.

BRUCELLOSIS A Symposium under the Joint Auspices of National Institutes of Health, United States Department of Agriculture and the National Research Council, September 22-23, 1949, Bethesda, Maryland—*American Association for the Advancement of Science*, 271 p., illus., \$4.00. A reference volume containing data accumulated by workers in the field of brucellosis.

CROSSBRED TYPES OF BEEF CATTLE FOR THE GULF COAST REGION—A. L. Baker and W. H. Black—*Gov't Printing Office*, U. S. Dept. of Ag. Circ. No. 844, 23 p., illus., paper, 10 cents.

DAMAGE TO GUAYULE BY INSECTS AND MITES WITH NOTES ON CONTROL—T. P. Cassidy, V. E. Romney, W. D. Buchanan and G. T. York—*Gov't Printing Office*, U. S. Dept. of Ag. Circ. No. 842, 19 p., illus., paper, 10 cents.

ELECTRICITY AND MAGNETISM Theory and Applications—Norman E. Gilbert—*Macmillan*, 3rd ed., 569 p., illus., \$5.00. A college text brought up to date.

ELECTROMAGNETIC THEORY—Oliver Heaviside—*Dover*, 386 p., illus., \$7.50. A complete and unabridged edition of a three volume work which appeared early in the twentieth century. Ernst Weber of the Polytechnic Institute of Brooklyn has written a critical and historical introduction.

A GERMAN-ENGLISH DICTIONARY FOR CHEMISTS—Austin M. Patterson—*Wiley*, 3rd ed., 541 p., \$5.00.

HEAT AND TEMPERATURE MEASUREMENT—Robert L. Weber—*Prentice-Hall*, 422 p., illus., \$6.65. A discussion of the theoretical principles of heat and temperature measurement and their application.

A HISTORY OF HORTICULTURE IN AMERICA TO 1860—U. P. Hedrick—*Oxford University Press*, 551 p., illus., \$7.50. The development of gardening, fruit growing and grape-raising from their earliest beginnings in this country through 1860.

THE INTERNATIONAL TRADE ORGANIZATION: Key to Expanding World Trade and Employment—Dept. of State—*Gov't Printing Office*, Publ. 3882, 34 p., illus., paper, 25 cents. The history, functions and goals of ITO are discussed with interesting graphs.

PHYSICS Fundamental Principles for Students of Science and Engineering—George Shortley and Dudley Williams—*Prentice-Hall*, Vol. I: 471 p., illus., \$6.00, Vol. II: Approx. 796 p., illus., \$7.35. An introductory college text.

PLANT PATHOLOGY—Edwin J. Butler and S. G. Jones—*Macmillan*, 979 p., illus., \$10.00. A treatise on plant diseases for the advanced student and the research worker. Includes over 400 illustrations.

PRINCIPLES OF GENETICS—Edmund W. Sinnott, L. C. Dunn and Th. Dobzhansky—*McGraw-Hill*, 4th ed., 505 p., illus., \$5.00. An introductory text.

PROCEEDINGS, FIRST NATIONAL CONFERENCE ON CARDIOVASCULAR DISEASES—American Heart Association, 259 p., paper, \$1.75. Presents the papers read before the conference which took place in Washington, D. C., January 18-20, 1950.

A REVISION OF THE NORTH AMERICAN SPECIES OF BEETLES BELONGING TO THE FAMILY BOSTRICHIDAE—W. S. Fisher—*Gov't Printing Office*, U. S. Dept. of Ag. Misc. Publ. No. 698, 157 p., paper, 35 cents. The results of a study made by the author of all the species of the family *Bostrichidae* known to occur in America north of Mexico and including lower California.

STRENGTHENING THE FORCES OF FREEDOM Selected Speeches and Statements of Secretary of State Acheson, February 1949—April 1950—*Gov't Printing Office*, Dept. of State Publication No. 3852, 192 p., paper, 50 cents. Includes many of the speeches which Acheson has made on our policies in Europe and the Far East. Also his speech on Point Four Legislation is given.

THE UNESCO STORY A Resource and Action Booklet for Organizations and Communities—*U. S. National Commission for UNESCO*, 112 p., illus., paper, free upon request to publisher, Department of State, Washington, D. C. (Limited supply only.) Provides background on the objectives and programs of UNESCO and gives information on "community action" projects throughout the country.

WHAT'S THAT TREE? A Key to 150 Tree Species—*Herbert Appleton*, 24 p., illus., paper, 25 cents. The author lists the main characteristics of the more important trees.

Science News Letter, July 29, 1950

MEDICINE

Cancer Fight Speeded By Research Program

➤ THE fight to stop cancer will be stepped up through a new research program announced at the Fifth International Cancer Congress in Paris.

Detection of materials in everyday life which might cause cancer is one part of this program. Translation of such findings from the laboratory to daily living with the aim of preventing cancer is another part of the new research program.

The program is to be conducted by a Cancer Prevention Committee with international membership. Chairman is Dr. William E. Smith, staff member of the In-

stitute of Industrial Medicine at New York University-Bellevue Medical Center, New York, where the committee will have its headquarters.

Science News Letter, July 29, 1950

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☛ **DRY BOX** for the pantry keeps foods ranging from crackers to salted nuts crisp and tasty even under high humidity conditions. The cover of the 16-inch-long box contains a pouch of a harmless drying agent, which can be reactivated when needed by drying in an oven.

Science News Letter, July 29, 1950

☛ **ELECTRICAL HEATER**, for the home aquarium to keep the water at the proper temperature, consists of two concentric metal tubes with a heating element between. Standing erect on the bottom of the tank, the heat creates a water circulation through the inner tube and the tank.

Science News Letter, July 29, 1950

☛ **NON-FOGGING MIRROR** in the bathroom has behind it an electric heater made of electrically-conductive rubber. The heater operates on ordinary household current and warms the glass to a temperature of 98 degrees Fahrenheit. A switch is provided to turn the current on and off.

Science News Letter, July 29, 1950

☛ **BASS OCARINA**, shown in the picture, sounds like a bass viol and was developed as an instrument suitable for radio and recording and for dance bands. It is provided with a built-in microphone and volume con-



trol, and with shielded cable to connect it with a public address system.

Science News Letter, July 29, 1950

☛ **EXIT LOCK** for emergency doors permits opening the door from the inside at any time by authorized persons with keys or by others in emergencies merely by striking a clapper. When the clapper is struck, an alarm bell rings, a safety device to prevent stealthy use of the door.

ing a clapper. When the clapper is struck, an alarm bell rings, a safety device to prevent stealthy use of the door.

Science News Letter, July 29, 1950

☛ **SCREEN POINTER**, for a lecturer at a distance to indicate a particular spot on a picture screen, utilizes a beam of light that makes a bright round spot or an arrow at the detail to be noted. It is a telescoping tubular affair, about 17 inches long when extended, with battery and lamp within the tube.

Science News Letter, July 29, 1950

☛ **TESTING SET** for a pilot's headset and microphone involves the use of an audio-oscillator and cathode ray oscillator, together with an artificial "ear" and artificial "voice." It takes all the guess work out of testing the delicate essentials of every aircraft's radio system.

Science News Letter, July 29, 1950

☛ **UMBRELLA COVERS** make it possible for a single umbrella to harmonize with the clothes of the user. The plastic covers, in a wide variety of colors and designs, can be put in place on the specially designed frame in two to four minutes.

Science News Letter, July 29, 1950

Do You Know?

Magnolias are called the aristocrats of the flowering trees.

Oil shale does not contain oil; it contains a solid organic material that yields oil when heated.

Barbed wire fence separates northern Norway from Soviet Union; it is an "iron curtain" in restraint of trade and traffic.

Gravitation is a general force by which every particle pulls on every other particle; gravity is the force exerted on a body by the pull of the earth.

The "Coyog" or "Dogote" is a cross-breed between dogs and coyotes frequently found where wild coyotes abound; this cross-breed is notorious for attacks on livestock.

The violent eruption of the volcano Tom-boro, near Java, is claimed to be responsible for 1816 being called "a year without a summer;" the almost world-wide dust resulting cut solar radiation.

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Atoms in Industry

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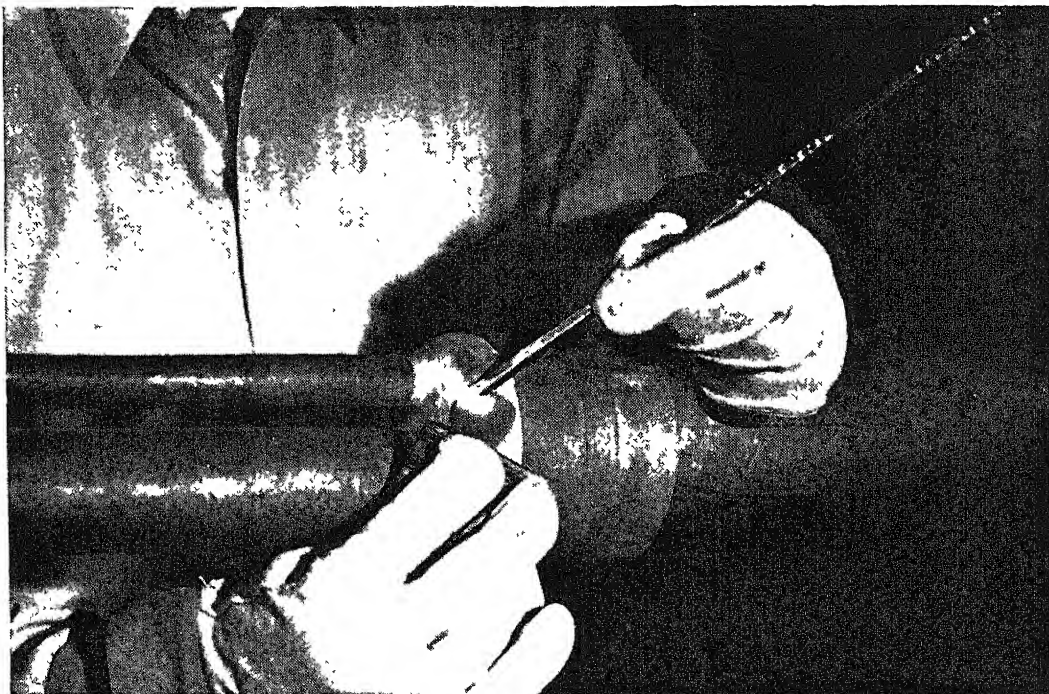
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To make cable joints tight and strong, splicers formerly used lots of solder. Then, Bell Telephone Laboratories developed a new technique for making better joints with much less solder. This saves one million pounds of solder a year — helps keep the price of your telephone service low.

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Cable-sealing solder is only one of 30 low-melting-point alloys which Bell metallurgists have developed for special uses — in fuse wires, for example, and in the solder connecting hair-like wires to piezoelectric crystals for electric wave filters.

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NUCLEAR PHYSICS

"Death Sand" Kills Subtly

An invisible death sand which is made by drying fission product salt solutions on sand or metal powder kills quietly. However, use of this weapon would be difficult.

➤ AN INVISIBLE dust of radioactive "death sand" could spread over cities of the earth and kill their populations by radioactivity without the noisy warning of an atomic bomb

This specter of radioactive poisons is raised again by Dr. Louis N. Ridenour, dean of the University of Illinois Graduate School, in a report appearing in the *BULLETIN OF THE ATOMIC SCIENTISTS*.

Citing a brief paragraph in the famous Smyth report of 1945 and an Austrian discussion of 1948 by Dr. Hans Thirring, the present analysis concludes that insidious use of the fission products of nuclear reactors would be a difficult weapon to use because of delivery to the target, chemical separation of the poisons and amounts available (enough for only two or three major cities a month).

This use of radioactive poisons in warfare is different from the radioactivity produced by atomic bomb explosions, whether the radiation of the bomb itself, the induced radioactivity in materials of the target city, or in chemical elements placed in the bomb to produce enhanced radioactivity

What would be done would be to collect the debris of smashed uranium atoms from atomic "furnaces" in which fissionable material is being "burned." About a dozen of these products would be useful in warfare. These emit beta rays (electrons) or gamma rays of substantial energy, and half of their substance would be disintegrated in periods from about a week to a year.

Very fine sand would be coated with these radioactive poisons and spread very thinly over the area where it is desired to wipe out life.

The person in a poisoned area has no way of knowing that he is in danger either by the evidence of his senses or by any unsophisticated tests. He may receive a lethal dose of radiation before he knows that he is endangered, and yet a few days later he may die. Radioactivity detectors would tell of the danger. If a person is aware of the danger he may survive if he flees the area at once with a dampened handkerchief over his nose and mouth. Walls of a sturdy building or even heavy clothing would lower exposure risk, but half an hour of breathing of dust stirred up by passing winds would give a fatal internal dose.

Radioactive "death sand" because of its novel and unique properties may be useful in special situations, but its proper use in war would be very difficult.

The "death sand" is prepared by drying fission product salt solutions on sand or metal powder. It is described as the lightest and most transportable of all the weapons of mass destruction. A highly deadly layer on the surface of the ground would weigh only 12 milligrams per square meter and would be quite invisible.

Secrecy has been clamped down in the United States on any hints about this kind of warfare since 1945, but Dr. Ridenour figures out that enough radioactive fission products are produced each month at the Hanford, Wash., plant to contaminate 144 square miles, or more than six and a half times the area of Manhattan.

Science News Letter, August 5, 1950

NUCLEAR PHYSICS

Radiological Warfare Agents Spotlighted

➤ ATTENTION was focussed on radiological warfare agents by a sentence in the

latest (eighth semiannual) report of the AEC to Congress. The sentence merely states that "studies on the feasibility of radiological substances as a method of warfare were continued."

But six months ago Secretary of Defense Louis Johnson reported on the subject in some detail.

"The possibility of radiological warfare is another outgrowth of atomic energy applications for national defense," he stated.

"The objective of this form of warfare would be to make a given area untenable through the presence of radioactive particles, called RW agents."

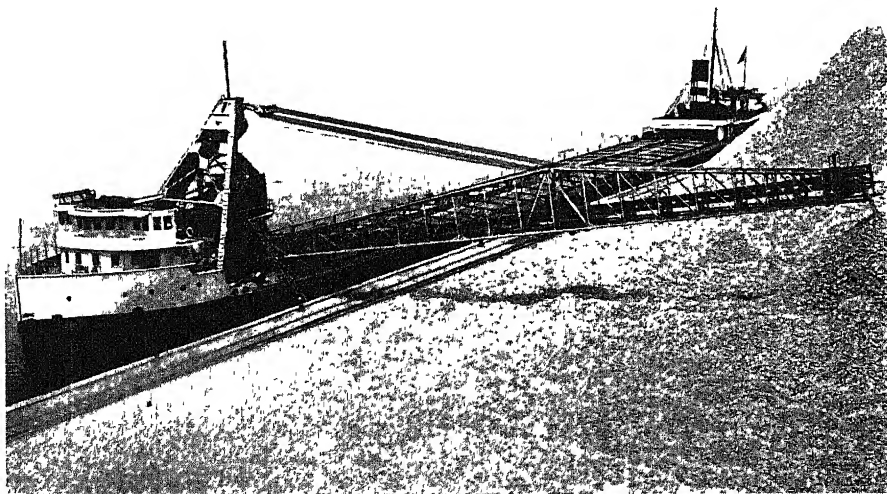
He warned that "every atomic pile of suitable size, irrespective of its design or purpose, is a potential source of significant quantities of RW agents, and RW weapons could become available to another country whether or not they produced an atomic bomb."

At present, RW is a "mystery weapon," he said. It could therefore cause panic unless people are informed about it.

Chief reassurance to those who are frightened by the possibility of RW is his statement that "orderly evacuation from contaminated areas should be possible."

One of the technical problems to be solved before RW could be used is that of separating desired agents from the complex of fission products.

It is not practical now to separate these products, Dr. George G. Brown, director



SELF-UNLOADING SHIP—Ten thousand tons of bulk cargo can be discharged and neatly piled ashore in about five hours, with as few as three men handling the conveyors and, if dock space permits, without assistance of any shore-based equipment. These ships, however, need not be built specifically for self-unloading. Successful conversions have been made of cargo ships that have operated for as long as 30 years by old-fashioned methods of unloading.

of the AEC's division of engineering, stated, adding that it would be difficult to accomplish this but not impossible.

The AEC report consisted largely of

details on measures and devices for protection against radiation injury as practiced in atomic energy plants.

Science News Letter, August 5, 1950

GENERAL SCIENCE

No Brains List Now

➤ OUR government has only an incomplete idea of the reserves of scientific brains at its disposal in this emergency. This is because "economy" in 1946 forced the abandonment of a national science roster which, during World War II, provided up-to-date information on all Americans with scientific and technical backgrounds.

Only recently has there been an attempt to recreate the list. Because of the new scientists who have graduated and received advanced degrees and because of the moving around of many other scientists, the old list is practically useless.

Right now the work has been farmed out by the National Securities Resources Board to the Office of Education in the Federal Security Agency. The National Academy of Sciences is cooperating in this effort. The job of keeping it up will belong to the new National Science Foundation when it is set up.

The National Research Council has a good list of most of the natural scientists with Ph.D.'s—physicists, chemists, etc. A comparable roster of engineers is being developed and work is just beginning on a roster of the social scientists.

A complete roster will be vitally necessary in a general mobilization. The armed forces, other defense agencies and laboratories working on new weapons must be able to know where to get the scientists they will need and how many with a particular talent are available.

Because we probably will have to use our present supply of scientists carefully, a system of allocating them on the list may soon be set up. There have been rumors that the National Science Foundation, designed as a peacetime agency, will be given this task.

Scientists hope that a reasonable method of allocation of their talents will be worked out. During World War II, some of the scientific societies worked hard to see that men were placed where they would do the most good. Most of this work was concerned with getting around Selective Service System and military establishment blunders in individual cases.

A complete roster of scientific talent, in the opinion of most scientists, is the basis of setting up a system which will make impossible the mistakes of World War II.

Science News Letter, August 5, 1950

PHYSICS

Radioactive Materials Help Find Best Oils

➤ RADIOACTIVE material from the atomic pile at Oak Ridge, Tenn., is playing an important part in Philadelphia in determining the effects of different oils on the wear of automobile engines. The process employed was described by scientists of the Atlantic Refining Company.

These scientists are working with engine parts made radioactive in the atomic pile.

They determine engine wear by measuring the amount of radioactive iron particles in the oil after a test has been run. These iron particles have been worn from the operating engine.

In making tests, the engine need be run for only about three hours. When the test run is completed, a metal cylinder containing a Geiger counter is dipped in the oil sample. This instrument immediately records the amount of radioactive particles in the oil.

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SCIENCE NEWS LETTER

VOL. 58 AUGUST 5, 1950 No. 6

43,500 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W. Washington 6, D. C., NORTH 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00, 3 yrs., \$14.50, single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N. Y. C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STAt 4439.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

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GEOLOGY

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INVENTION

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Photographs: Cover, Ford News Bureau; p. 83, Hill and Knowlton; p. 87, Shell Oil Company; p. 96, Tennessee Eastman Corporation.

MEDICINE

Babies and children taking diphtheria and whooping cough shots during the summer and early fall are more susceptible to polio.

➤ TO avoid danger of infantile paralysis, babies and children should not be given "shots" against diphtheria and whooping cough during summer and early fall, when infantile paralysis is likely to appear.

This warning was sounded at the sixth International Congress of Pediatrics in Zurich, Switzerland. It was based on findings of a number of doctors in England and Australia. The baby and child specialists who devoted a special section to this subject considered it one of the most significant of the Congress.

Babies routinely immunized against diphtheria and whooping cough contracted infantile paralysis more often than other children, Drs. Philip R. Evans and J. Kenneth Martin of Guy's Hospital, London, and Dr. B. P. McCloskey of Adelaide, Australia, discovered independently in the summer of 1948.

The paralysis, these doctors found, nearly always affected the arm or leg where the "shots" had been given.

The presumption is that had it not been for these "shots" the poliomyelitis virus might have produced either no visible disease or else non-paralytic disease. The injections, however, lowered the resistance of the child locally, that is, in the arm or leg, or else set up conditions favorable to the local multiplication or spread of the virus, resulting in local paralysis.

Dr. Martin who has moved to Winnipeg, Canada, confirmed these findings last summer in that Canadian city.

A statistical analysis of the findings which indicates they are highly significant has been made by Dr. Bradford Hill, in England.

Dr. Martin was at first very hesitant to report his findings, fearing that they would stop people from having children and babies immunized against diphtheria and whooping cough. This would be bad because both diphtheria and whooping cough are much more likely to kill than infantile paralysis. They are also likely to attack many more children when the immunizing "shots" are not given.

Dr. Evans and others at the Congress feel that the net result of the findings should be merely to change the time when these protective immunizations are given, so that they are not given during summer and early fall, the polio season, or at any time when polio is prevalent in the community.

Smallpox vaccination does not seem to produce the predisposition to paralytic polio

attributed to diphtheria and whooping cough immunizations.

Reports on the link between polio and whooping cough and diphtheria immunizations were given by Dr. Evans and Dr. W. H. Geffen of St. Pancras Hospital, London.

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ENTOMOLOGY-CHEMISTRY

Chemical Dust Jacket for Grains Kills Insects

➤ CHEMISTRY has come up with a new weapon against a public enemy now costing the U.S. about \$500,000,000 a year.

One-shot chemical treatment of a grain elevator or storage bin, giving protection for an entire season against the weevils, beetles and other pests which ruin up to 10% of the nation's grain crop after it has been harvested, was announced by U.S. Industrial Chemicals, Inc.

The treatment is built around a relatively new insecticide called pyrenone. For wheat protection, the chemical firm mixes this compound with fine wheat dust; for other grains, with fibrous talc, a finely-ground mineral.

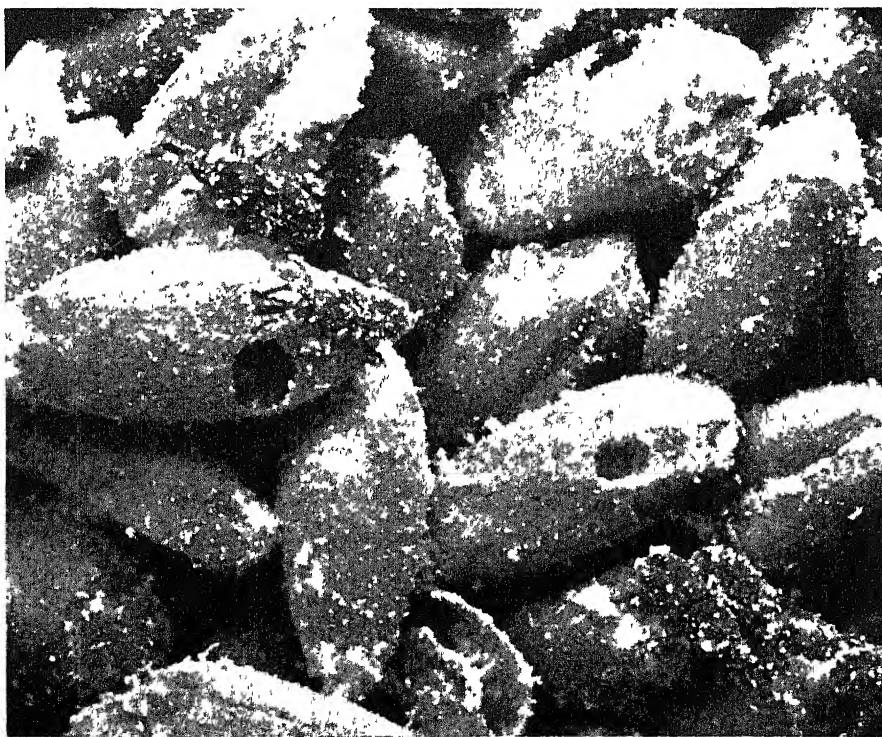
Applied to grains as they go into storage, these dusts cling to the kernels. The insect-proof vests they provide have been shown in extensive tests to last as long as nine and a half months. Yet the insect-killing ingredient in the dust, a chemical called peronyl butoxide, is completely harmless to humans or animals. Thus it may be used with safety in grains headed for the flour mill or the feed trough.

Until now the only insect control available for stored grain has been fumigation. This gives a good kill of insects already in the grain, but offers no protection for infestations a week later.

The U.S. Department of Agriculture is currently testing the new compounds at its insect laboratory in Manhattan, Kansas. Government officials said the new product has a huge potential market, running to many millions of dollars.

This year U.S. Industrial Chemicals will have only limited quantities of its new insecticides available. But as production increases, prospects for the familiar weevil and his billion-dollar appetite will take a decided turn for the worse.

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WEEVILS AT WORK—The insects lay their eggs in the holes bored into the kernels, which are tiny pinpoints to the naked eye. The snow-like residue on this untreated grain is left by the insects. Treatment with pyrenone would prevent such havoc as this.

ASTRONOMY

Earth Formation Theory

The evolution of our present solar system is traced. Due to the weakness of gravitational forces, gases from the original cloud escaped, the particles forming a solid mass.

➤ HOW the earth and planets were formed was described in Berkeley in a new theory by Dr. Wendell Latimer of the University of California.

The chemical reactions accounting for the evolution of the solar system are set forth in the general framework of theories that have gained wide favor among both astronomers and geologists.

Dr. Latimer states the steps by which the earth and planets developed into their present form from a great, cold cosmic cloud. He also accounts for the elimination of gases from the cold cloud—a big stumbling block in cosmology.

While the cosmic cloud was still diffuse and in the early stages of condensation, Dr. Latimer proposes, it broke up into smaller clouds from which the earth and planets were formed.

The particles of the earth cloud, at that time about 10,000 times larger than is the earth today, were of a varying weight. Because gravitational forces were so weak, the gases in the cloud escaped from the cloud. Then the particles fell together to form a solid mass.

Because of the variations in weight, the particles fell together at different velocities. So the metals, being the heaviest, tended to be at the center of the earth mass, with the lighter silicates and basalt particles on the outer layers.

Thus, when the earth was originally

formed, says Dr. Latimer, it was cold and had no appreciable atmosphere, water or continents. He reported his theory in the journal, *SCIENCE* (July 28).

But in this earth mass there was a lot of potassium, uranium and other radioactive materials. The heat provided by this radioactivity was enough to raise the temperature of the earth's surface to 2000 degrees centigrade 1,500,000 years after condensation of the cloud. The radioactivity-produced heat was also the source of the energy for chemical reactions which created the atmosphere, water, continent and mountains of the earth.

For example, decomposition of basalt into granite and dunite, the latter being among the very heavy rocks of the earth, was responsible for the building of continents and mountains. The heavy dunite sank to lower levels, the granite rising.

Water was formed by the breaking down of water-containing silicates and aluminates. Carbon dioxide was formed by the reaction of iron oxides with carbides, and a sequence of reactions provided hydrogen and nitrogen for the atmosphere. Oxygen was added later through photosynthetic processes.

Dr. Latimer estimates that about half of the solid particle material of the universe has been condensed into planets and stars. The remainder, in great cosmic clouds in space, is the stuff of which new inhabitants of the expanding universe are being formed.

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this point the wounded are moved to evacuation hospitals and thence flown to large hospitals in Japan.

Wounded who will require 120 days or longer to recover are being flown back to the United States. The others can be cared for at the hospitals the Army has in Japan.

New drugs for fighting the diseases our troops will encounter in Korea and for stopping infection in wounds add further strength to the chain of mercy.

For malaria, one of the two chief disease dangers in Korea, there is chloroquine. A tablet taken once a week does the work the skin-yellowing daily tablet of atabine did in World War II.

Landing parties and troops transported by air will not arrive too seasick or airsick to fight, thanks to dramamine.

Against scrub typhus, a potential threat in Korea, the Army has chloromycetin whose value was proved by Army doctors in tests in Kuala Lumpur since World War II.

And there is a new vaccine against Japanese B encephalitis, a disease that attacks brain and central nervous system.

Besides malaria, the chief disease threats our troops face in Korea are dysentery and diarrhea. Protection against these, as against malaria, depend chiefly on self-discipline on the part of the GIs who must stick to safe water for drinking and bathing, take the chloroquine tablet regularly and take precautions against mosquitoes whenever possible. Mosquito control units are operating in Korea.

Theater Surgeon Maj. Gen. Edgar Erskine Hume expects neuropsychiatric cases to be above normal because of the type of military operation in Korea.

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ARCHAEOLOGY

"Light" for Cigarette Is Clue to Oldest Village

➤ WHEN a village sheik in Iraq used a flint and steel to light a cigarette offered by an archaeologist it furnished the clue which led to the unearthing of the oldest known village site, about 7,000 years old.

It turned out that the flint, one of many which have been found on a nearby mound of Jarmo, was a product of the late Stone Age.

An expedition will soon set out under the direction of Prof. Robert J. Braidwood, of the University of Chicago's Oriental Institute, to explore the Jarmo site. The oldest known row houses may be found here.

Bones unearthed at Jarmo during a preliminary study of the site showed that the people of this ancient village raised crops and had domesticated animals.

The site was dated by the very modern "atomic calendar" developed as a by-product of atomic bomb studies. Measurement of the amount of radioactive carbon 14 found in snail shells from the site showed it to be about 7,000 years old.

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MEDICINE

Smooth Medical Service

Korean forces are backed up by an efficient and well operated medical service. Each company now has four aid men instead of the two it formerly had.

➤ BACKING our fighting forces in Korea is the most efficient, smooth-working rescue operation that has ever existed in history. It is known as the Army Medical Service and it celebrated its 175th birthday the week of July 27.

The unbroken chain of mercy operated by this service from the front line to gigantic military hospitals in the United States has been strengthened in several ways since World War II.

Right at the front, when a wounded man calls "Medic," there are twice as many aid men to answer his call and help him.

Each company now has four instead of two of these aid men to put on splints, give morphine to ease pain and start the wounded GI back to shelter and waiting doctors and nurses.

When he has been carried by litter, ambulance or jeep litter as far back as the division clearing station, he will find another of the strengthened links in the chain of mercy. This is the mobile surgical hospital, a new unit since World War II. At this point major surgery can be performed for those wounded who cannot be transported any farther without such care. From

METEOROLOGY

From Now On: Weather

Long range weather forecasts will chart weather far in advance with techniques of the future. The cold and warm years may also be predicted.

By WATSON DAVIS

Nineteenth in a series of glances forward in science.

➤ THE day has long since passed when a farmer or a business man went to a patent medicine almanac for his weather forecast. He now reads the daily forecast in his newspaper, checks changes in predictions hour by hour by telephone or radio, and governs his work and pleasure accordingly.

The airplane pilot has his flight path determined for him by the airport meteorologist. Thanks to a vast world system of weather reports, almost every place knows the weather of every other place as it happens.

A couple of decades ago trying to foresee what was going to happen in the earth's atmosphere—what we call "weather"—was largely a two-dimensional activity. The weather men knew only what was happening at the surface of the earth. Now weather forecasting is three-dimensional and highly dynamic. Air masses as they rush over the surface of the earth are followed and pictured on the weather map hour by hour.

Temperature, humidity, barometric pressure, wind and precipitation of various sorts are still some of the basic physical factors that the meteorologist uses. Supplementing the conventional observations of the ground level, balloons carry automatic self-supporting weather stations aloft for many miles upward, radar follows thunder storms and airplanes make routine but astounding flights over areas such as the North Atlantic where permanent weather observation points are lacking. With a better picture of the circulation of the earth's atmosphere and the course of storms, the meteorologists have been able to extend their forecasts as to what will happen weatherwise in a given locality as far ahead as three or four days or a week.

For a broad area, such as a state or a section of the country, much more extended forecasts, looking forward to what will happen in the way of rainfall and temperature, are now being made public by the United States Weather Bureau. For example, this spring's unseasonably cold weather along the east coast was predicted a month in advance by this new service.

Some study is being directed toward intelligent guesses as to whether seasons will be normal or abnormal. Obviously, these must be experimental and hazardous because it takes so long in time to test the applicability of many complex factors.

The weather has so much to do with how

much food the farmers of the world will raise that our weather men may eventually even warn us of bad harvests ahead, or the probability of dangerous agricultural surpluses in our future.

For the sornier business of a fighting war, weather forecasts could determine when bombers should fly, troops make their landing, and atomic weapons spray their death. For weather is a weapon.

Whether we can do anything about making our own weather, particularly rain, is still problematical. By spraying clouds with rain-promoting particles, it seems possible to give nature's processes a bit of a push at least under certain relatively infrequent conditions. There are threats already in some areas of legal action to protect the water resources of the upper atmosphere. Today some people spray for rain instead of pray for rain.

The energies involved in a large storm are so immense that any artificial methods of changing major air movements seem fantastic.

Predicting meteorology's future in the coming years.

A. Forecasts of general weather a month and more ahead will become bolder and more accurate with increasing experience and will be used more extensively for planning many human activities affected by the weather.

B. Watching the weather from hour to hour will become even more effective than today's high precision, with the possibility that even the swift and uncertain course of tornadoes may be determined by radar and other means in time to warn of the danger.

C. The cold years and the warm years that are brought by gradual cyclical shifts of climates may be determined in order to give us long-range notice of unusual heat, cold and drought.

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ENGINEERING

Oil Progress in Pipeline Controlled Automatically

➤ THE progress of petroleum products flowing through a 450-mile pipeline in the Midwest can be noted and controlled in New York with equipment in the offices of the Shell Oil Company. The progress is recorded on a 17-foot control board.

The pipeline extends from a Shell refinery near St. Louis to Lima and Columbus, Ohio. The secret is a series of stations

along the line in which pumps are equipped electrically so that they may be started or stopped and valves opened or shut, using remote control by wire from the central office.

Code numbers on a telephone dial attached to a teletype machine do the job. The equipment in the pumping stations automatically reports on operating conditions. A set of meters reports to New York by teletype the suction and discharge pressures and electrical load of each station whenever the New York operator dials particular numbers on his teletype.

This pipeline, unlike those that carry only one product, is equipped so that it can handle one after another as many as 22 different finished petroleum products. Such products as gasoline, naphtha, kerosene and fuel oil can be pumped into the line, following each other through. At convenient intervals, a portion of any product can be taken out and put in tanks for distribution to local customers.

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● RADIO

Saturday, August 12, 3 15 p.m. EDST

"Adventures in Science" with Watson Davis, director of Science Service over Columbia Broadcasting System.

Dr. William Menninger, general secretary, and Dr. Karl Menninger, director of education, Menninger Foundation, Topeka, Kans., will discuss "The Mind and Research".



KEEPING TAB—A 17-foot control board in Shell's New York office traces the progress of every gallon of oil product in the 450-mile pipe line in the midwest. Shell dispatchers set markers and adjust charts to show exactly where each product is, 24 hours a day. Products move through the line at about 4 miles an hour.

MEDICINE

Find Virus Cause of Infant Diarrhea

► **DISCOVERY** of a virus believed to be one cause of epidemics of diarrhea among newborn babies was announced to the Sixth International Congress of Pediatrics in Zurich, Switzerland, by Dr. Horace L. Hodes, pediatrician in chief at Mount Sinai Hospital, New York.

The virus was found in outbreaks of diarrhea among newborn babies on four different occasions in two hospitals in Baltimore, Md., and Washington, D. C.

Dr. Hodes does not suppose that this virus is the cause of all the outbreaks of diarrhea which sweep through hospital nurseries, sickening and often killing new babies. But apparently it is the cause of some and perhaps many of these epidemics.

In studies with Dr. Jacob S. Light, Dr. Hodes found that this virus would regularly produce diarrhea in young calves. The virus can perpetuate itself, multiplying in the animal's body.

Further evidence that the virus which caused the disease in calves was the one that made the babies sick came when Drs. Hodes and Light injected blood serum from two babies who had recovered from the epidemic diarrhea into two calves. This serum completely protected the calves from the infection, and the serum from two more recovered babies partially protected another two calves.

Material from stools of eight normal infants caused no disease in calves.

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AERONAUTICS

Faster than Sound Missiles Studied

► A **NEW** scheme to study the behavior of airplanes and missiles traveling faster than sound utilizes a tiny model of the object which is shot from a gun through very cold gas. In such a gas, sound waves travel relatively slowly.

The speed of sound is approximately 760 miles an hour at sea level under ordinary conditions, but in a dense gas, obtained by cooling, it is less. In this method very low sonic velocities are obtained by cooling the gas to very low temperatures, using liquid nitrogen.

This method was employed at the Langley Aeronautical Laboratory of the National Advisory Committee for Aeronautics and found successful. A report issued in Washington by the NACA states that the practicability of increasing the Mach number of a model by refrigeration of the test medium is established.

Mach number is the ratio of the speed of the object to the speed of sound. A Mach number of 6.7 was obtained in these

tests. This means the velocity of the model used was 67 times the speed of sound in the highly cooled gas used.

In the investigation, a commercially available 22-caliber high velocity gun was used to obtain velocities of some 4,200 feet per second. The chamber was filled with nitrogen gas. The low-temperature chamber was composed of two cylindrical compartments, one within the other. The cooled test gas was contained within the inner cylinder.

Focused shadowgraphs were taken through windows. They are known as schlieren photographs and show the shock waves about the model. Twin photocells operated the equipment to record the time required for the model to traverse the space between the cells.

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Light Tanks without Armor for Future

► **LIGHT** tanks without armor—or with very little armor—that can move fast over rugged terrain may one day replace the lumbering, almost road-bound 35- to 60-ton tanks in our armed forces.

This is the conclusion of Col. Hamilton H. Howze, now on duty with the Army General Staff, in an article in the *COMBAT FORCES JOURNAL* (August).

"Granting that the tank has lost much of its ability to plow through shot and shell (an ability that was always much overestimated)," he said, "it may gain a more than compensating mobility and destructive power."

Col. Howze wrote his article to the question: "Is the tank a dead duck?" He answered that with another question: "Is mobility obsolescent?"

"When the gasoline engine was developed," he pointed out, "the horse became obsolescent—but only because the motor could do the job better. It follows then that so long as the motor is capable of propelling a vehicle that can carry effective guns and heavy loads of ammunition—and other destructive devices—to and about the battlefield, there will be the greatest demand for its services. Only the shape of the vehicle will be changed."

New anti-tank weapons like the 3.5 bazooka, he intimated, far from outmoding the tank, serve only to influence its design and change its tactics. The new tank must learn to avoid the hit, rather than absorb it, and must improve its ability to kill. Barring radical improvements in armor, the tank cannot hope to wall itself off from projectiles.

"There is no weapon that presents a more challenging prospect," he concluded, "than tanks do for those of us who are willing to throw off the restrictions of the past."

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CHEMISTRY

Carbon Dioxide from Coke with Iron Ore

► A **NEW** method of making carbon dioxide for use as dry ice and in soda pop and fire extinguishers has been developed in Cambridge at the Massachusetts Institute of Technology. It is a short cut over older methods and results in pure carbon dioxide directly by reacting coke with iron ore.

In the process, powdered coke and ore are mixed together and form a "fluidized powder" by means of a stream of pure carbon dioxide blown through them. The process is somewhat similar to one employed in the petroleum industry where a fluidized material is used as a catalyst in the refining process. The material is not actually a fluid but, because finely divided and kept alive by the current of gas, acts somewhat like a fluid.

In this new method of making carbon dioxide the mixture of coke, iron ore and gas bubbles like a liquid. The coke is converted to carbon dioxide by taking the oxygen from the iron ore. The resulting gas is drawn off and the ore, stripped of its oxygen, is regenerated with oxygen from the air and used over again.

Usually carbon dioxide is made by burning coal, giving a mixture of the desired gas with nitrogen from the air. The resulting mixture has to be treated with chemicals to absorb the carbon dioxide, and the fizz gas is then obtained by heating.

The new process was developed by W. K. Lewis, E. R. Gilliland and M. P. Sweeney of the M. I. T. staff. It was described by them at a regional meeting of the American Institute of Chemical Engineers held in Cambridge.

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AGRICULTURE

Hybrid Sugar Cane Is Tailored for Machine Age

► **HYBRID** sugar cane tailored to the machine age was unveiled recently by the Department of Agriculture, Louisiana Agricultural Experiment Station and the American Sugarcane League.

Erect growth, uniform stalk height and stiffness during cutting and stacking make the new variety naturally adapted to mechanical harvesting. Latest in a long series of hybrids developed for the Gulf States since mosaic disease all but wiped out Louisiana's sugar cane plantation a generation ago, the new cane even has a machine-age, coldly factual name: "CP 43/47."

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THE FIELDS

MEDICINE

Vitamin B₁₂ Prevents Shock

➤ VITAMIN B₁₂, that is proving of importance in promoting growth in animals and humans, as well as treating pernicious anemia, now is shown to be able to prevent anaphylactic shock, even when used in very small quantities

In experiments with guinea pigs, Dr. Vincenzo Traina of Fairview Park Hospital, Cleveland, found that no other substance is able to protect from this form of shock when used in such small quantities

Dr. Traina made his report to the British science journal, *NATURE* (July 8)

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MEDICINE

Use Embryos to Prospect For Anti-Cancer Chemicals

➤ CHICK embryos can be used to prospect for possible cancer-controlling hormone chemicals, Dr. C. Chester Stock of Sloan-Kettering Institute, New York, announced at an international gathering of cancer researchers at Ciba Foundation in London

The method is based on the observation that minute quantities of cortisone and other anti-cancer steroid hormones cause baldness in the embryos and inhibit their growth

The stunting and baldness are not directly correlated with anti-cancer activity, Dr. Stock said, but they are indicative. Since very tiny amounts of active steroids will produce these chick embryo effects, the method should be an invaluable screening measure for detecting the presence of promising chemicals in mixtures and extracts of uncertain composition.

An alternative screening method is to measure the effectiveness of a steroid in inhibiting the growth of certain tumors implanted in mice. The advantage of both these methods over direct trial on patients is that they require such small quantities of the chemical, which is often initially available only in preciously small amounts.

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NUTRITION

Correct Foods Not Chosen Automatically

➤ DON'T be fooled by the "naive assertion" that a child or adult will automatically choose the foods he needs on the simple basis of taste and appetite. This is the warning of Dr. C. G. King, scientific director

of the Nutrition Foundation in New York.

Some individual animals have automatic guidance in selecting foods needed to preserve or regain health. This was shown in experiments by Dr. E. M. Scott and associates at the University of Pittsburgh. But Dr. King explains that this ability varies with different nutrients and from animal to animal.

Even when in a cage where they could eat a good quality milk protein whenever they wished, many animals in Dr. Scott's experiments lost weight and even starved to death for lack of protein.

Even more striking was a failure to select essential magnesium salts even when salt mixtures containing them were available

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RADIOLOGY

Radioactive Arsenic and Gold Valuable Tracers

➤ ARSENIC and gold in their radioactive forms are two of the Big Six medically valuable radioactive tracer atoms at the present time, Dr. Leon O. Jacobson of the University of Chicago declared at the sixth International Congress of Radiology in London.

More than 700 radioactive tracer atoms have been prepared, he reported, but he called these six the most valuable.

Radiophosphorus is used in many forms of diseases of the blood and blood-forming organs and radiiodine is used to treat thyroid gland cancer. The other four are promising, Dr. Jacobson said, but have been less thoroughly explored.

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INVENTION

Earphones at Each Seat Allow Opera Translations

➤ AS the thunder and fire of a Wagnerian opera roll out across the Metropolitan Opera House, how many of the opera-goers can understand the words being sung? Not many, says a music-loving inventor from Morristown, N. J., who would like to put science to work at the opera.

Single miniature earphones at each seat would allow a running translation of the opera by a competent narrator, B. F. Miessner writes in the *JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA* (July). Coin-released, the earphones would have an output just loud enough for the listener, but low enough not to disturb the persons next to him.

Held by rubber earplugs sterilized each day, the listening device could be switched on or off at will. Such a scientific sound system might even popularize opera enough to make it profitable, Mr. Miessner theorizes.

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MEDICINE

Sleeping Depends On Brain Stem

➤ "TO sleep, perchance to dream" depends on the brain stem, it seems from studies by Dr. H. W. Magoun, professor of anatomy of Northwestern University Medical School.

The brain stem, about the size of a man's thumb and four or five inches long, runs from the top of the neck up into the skull to the two cerebral hemispheres of the brain

Dr. Magoun, assisted by Dr. D. B. Lindsley, Northwestern professor of psychology, and Dr. Giuseppe Moruzzi, visiting professor from the University of Pisa, Italy, came to the conclusion that the brain stem serves normally to keep the rest of the nervous system awake.

Dr. Magoun reported that by direct stimulation of the brain stem of sleeping animals it is possible to produce all the features of wakefulness. Destruction of the brain stem, on the other hand, leaves animals in a state of pathological sleep.

However, it is not yet known just how the brain stem controls sleeping and waking states. Dr. Magoun thinks that sleep in man is brought about by a lessening of sensory impulses which reduces brain stem activity

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METEOROLOGY

Frigid Upper Air Sinking Causes Winter's Cold Spells

➤ MASSES of frigid air in the stratosphere that sink to the earth are the cause of severe winter cold spells that grip large sections of the globe simultaneously.

This is the opinion of Dr. William Kellogg, geophysicist at the University of California at Los Angeles, who bases it on evidence gathered while studying upper atmosphere conditions for the U. S. Weather Bureau. This is his theory

Air masses are constantly circling the earth. There appears to be a continuous flow of air from the summer hemisphere to the winter hemisphere in the region between 20 and 50 miles high. As a result, air is piled up over the polar regions in the winter—with a consequent sinking and outflow in the lower atmosphere.

This outflow at low levels from the winter pole may be more rapid when the flow in the upper atmosphere speeds up. Such an increased outflow would cause the cold air masses near the ground to move toward the equator, thus causing severe cold spells in the middle latitudes.

Evidence for Dr. Kellogg's sinking theory is that ozone is occasionally forced to the ground level in polar regions in winter. Normally, ozone exists at altitudes of 10 to 20 miles.

Science News Letter, August 5, 1950

INVENTIONS

Phantom Inventions

Legends about inventions ranging from the everlasting razor blade to the better carburetor have sprung up. Attempts to trace such stories end in dead alleys.

By ROGER WILLIAM RIIS

► "THE straight fact is—and I know what I'm talking about—it is perfectly simple today to produce a carburetor that will give us 50 miles to a gallon of gas. But the big oil companies suppress it. They've bought up the patent and put it away in permanent cold storage. You don't think they'd be fools enough to cut their own throats by producing a really good carburetor, do you?"

Have you heard about that carburetor?

Have you heard about the steam automobile which could be built today vastly superior to the gasoline buggy—if the oil companies and all the other established automotive interests would only stop suppressing the patents?

Have you heard of the telephone instrument which the telephone people could perfectly well manufacture, with television attachment so you could see the person you were talking to? Or the camera with built-in exposure-meter and automatically controlled shutter, which the camera people could produce profitably for \$10, if only they would stop suppressing the patents?

Or the razor blade, to fit any safety razor, made out of a new steel alloy treated by a new atomic method so that a single blade will last forever? Or the individual radio, no bigger than a match box, so you could be always in touch with whomever you wanted to be in touch with?

Stories about such inventions go on and on, told year in and year out, always with indignation at the wicked corporations, and always with "I got it straight because the chap who works next to me has a brother who—"

The stories have four common characteristics: (1) they are never first-hand; (2) the hero is usually a poor but brilliant inventor, (3) the villain is the wicked corporation which suppresses the most desirable inventions to its own cash profit and to the public's lasting suffering; (4) they are all untrue.

Recently several companies have been at pains to run down these rumors. They wanted to run them down because, if there were any such splendid inventions anywhere, the companies wanted to buy them and use them. If there were in fact no such inventions, the companies were curious to find out how the stories ever got started.

The myth of the everlasting razor blade recurs, with annoying frequency, the Gil-

lette Company admits—every year or so, but always by word-of-mouth rumor. But not long ago it became so definite as to appear in print in a reputable newspaper, which even said that Gillette had paid seven million dollars for the patent.

Hopeful of coming to grips this time, the company wrote the newspaper, saying they knew nothing of any such patent or transaction, but would very much like to. After months of effort, by newspaper and manufacturer, this is what developed:

The writer had been told the story of the razor blade by his former professor of journalism. This looked like a sure lead. But the professor, questioned, could only say "I have been trying to think just where I got hold of the information concerning Gillette. It occurs to me that it came from a book called *Putting It Over*. The names of the authors escape me at the moment but I remember it is by two men, experts in the general publicity field. I can see the cover of the book, black and soft leather, and the thickness, but I can't get the names."

Though the professor could not trace down the book which he asserted was his authority, the Gillette Company did, through the Library of Congress. Neither the story in question nor any mention of Gillette appear in the book. The trail simply disappeared. Once again Gillette missed out on the everlasting razor-blade.

During 1949 such very circumstantial stories about an astounding new carburetor ran around the country that Sun Oil took notice. Millions of people heard the story, which kept very close to the same plot.

A man who had been months on the waiting list for a new car was overjoyed when at last his number turned up. Proudly he drove away in his new chariot, and spent every leisure moment of the next month in it. After the first 500 miles he took it back to the dealer for a check-up.

"It's the most marvelous car ever," he assured the dealer. "Your sales talk didn't do it justice. Do you know, I've been getting 50 miles to the gallon of gas?"

"What!" gasped the dealer. "Good heavens! Wait a moment!"

Swiftly he lifted the hood and looked within. A moment later, greatly disturbed, he turned to his customer:

"Say, I'm awful sorry about this, but you got the wrong car. You got a special factory job they've been looking for all over the country, one they were experimenting on. It got out by some mistake, and

they've got to get it back. My orders are to give you anything you want in the way of another car or a cash refund."

There are fascinating little variations in the story, which give it remarkable semblance to truth. In one version the story ran that two such experimental cars had got out, but one had been found in New England and recovered. In another, the owner of the car was given a new car of twice the sales value plus a check for \$1000.

The stories were outstanding for their clarity and definite detail. Sun Oil therefore sent men out to track down this mystery car. When they were told "a business friend of mine from Chillicothe actually knows the guy it happened to," off they went to Chillicothe. But the business friend didn't know the guy it happened to, he knew a bar-tender who had had the story firsthand from a pal.

You know the rest. The investigators never succeeded in getting any closer to the source of the story, or to the wonder carburetor than you are now. They never got any name for the supposed inventor, or the name of the oil company that supposedly had concealed the patent, or the name of the dealer who had sold the car.

After long investigations, Sun Oil points out several details of importance: in the first place, it is physically impossible for a factory-test car to become mixed up with the production-line cars. They aren't even made in the same plants. In the second place, no industry has been as plagued by rumor as has the oil industry by the insistent rumor of vast savings in fuel consumption. Most of us have seen mysterious contraptions hooked up on cars whose hoods have been raised as they stand in a busy city street, while swift-talking demonstrators orate and sell samples. There are at this moment probably a dozen such get-rich-quick schemes being promoted—at someone's expense.

The National Bureau of Standards has recently tested the current crop of alleged gas economizers. After many years at this testing, the engineers say sadly that they have never discovered a single one with any basic value. A few of them do actually effect a small fuel saving, but they do it by mixing additional air into the carburetor, a simple matter which can be much more efficiently done by adjusting the carburetor itself.

"We have been accused of delaying introduction of more efficient types of equipment," admits the American Telephone and Telegraph Company and adds plaintively, "but the facts do not bear this out; on the contrary, the Bell System has made outstanding advances in the telephone art."

Perhaps the best guaranty that no patents have been suppressed for selfish reasons came during the days of the Temporary National Economic Committee, more familiar as the TNEC. In 1938-39, TNEC held exhaustive hearings on charges that patent rights were being abused, and the make-up of this Committee was not partial to big business. If it could have found evidence of patent sins, it would have been happy. At the same time, a national group of scientists and two national business associations launched the same search, inviting one and all to come and testify. No one did. Not a shred of evidence suggested any suppression of any patent.

International Business Machines has a smoothly functioning method to insure that anything remotely resembling a useful invention gets a fair chance. General Motors has built up for 26 years its New Devices

Section in which it has opened 103,000 files for individuals who have submitted over 145,000 devices. These range from complicated mechanisms and highly technical processes down to a simple suggestion like a light under the hood. Over 3500 persons have suggested directional signals, over 1000 have submitted the idea of headlights that turn with the front wheels.

The company gives every idea careful attention, because you just never can tell. Among the many inventions they have bought since the war are developments in steering linkage, engine-mounting systems, combined starter and accelerator controls, cages for ball bearings and similar highly technical devices.

"We certainly aren't suppressing anything," exclaim the engineers unanimously. They ought to know.

Science News Letter, August 5, 1950

GEOLOGY

Germanium in Washington

➤ THE richest deposit of the vital war material, germanium, yet found in the United States has been discovered in the earth of parks, playgrounds and other locations in Washington, the nation's capital.

This vein of treasure from the Patuxent formation runs from Baltimore to Richmond, U.S. Geological Survey scientists find.

The deposits contain up to six percent germanium. The highest content previously reported, in the mineral germanite in Africa, was 10%. The District of Columbia deposits also contain vanadium, chromium and gallium.

Discovery of the new germanium deposits is reported by Taisia Stadnichenko, K. J. Murata and J. M. Axelrod in the journal *SCIENCE* (July 28).

The deposits are in the lignite remains of *Cupressinoxylon wardi*, a tree somewhat

similar to the coniferous family from the Cretaceous era, about 100,000,000 years ago.

Germanium is particularly valuable for electronic instruments. It is a semi-conductor, being intermediate in conductivity between metals and insulators. Photo-electric cells, rectifiers, transmitters and mixers (combination transmitters and amplifiers) are among the important uses for germanium crystals. These crystals are rapidly replacing vacuum tubes for many uses.

Mining operations in such a thickly populated district will make recovery of the germanium in these deposits somewhat of a problem. The germanium and the other elements, however, are recoverable if the need should be great enough. Previous to this discovery, the main source of germanium in the U.S. has been as a by-product recovery.

Science News Letter, August 5, 1950

when taking aureomycin orally. The patient retains enough aureomycin in this way for it to be effective.

Science News Letter, August 5, 1950

On This Week's Cover

➤ INDUSTRY seeks to harness atomic energy! A dramatic moment was reached as a gas sample was taken following addition of isotopes to molten steel in an experimental foundry.

The metal was made radioactive in order to investigate possible application of tracer technique as an aid to quality control in steel production operations. When a minute amount of radio-isotope is added, the activities and changes of elements in the metal can be more readily traced. It was hoped to determine quantities of elements evolved in the gas and those remaining in the metal.

Research engineer taking the sample (holding long-handled steel rod, padded with asbestos) wears coat, gloves and respirator which comply with safety and health requirements set by the U.S. Atomic Energy Commission to prevent contamination. Respirators are worn in any location where air-borne beta and gamma emitters are present. All operators conducting this experiment wore laboratory coveralls to reduce clothing contamination.

Engineer at left watches as gas enters bottles containing liquid. These instruments are held by floor-type ring stand. The gas-collection apparatus is operated by vacuum pump. Instruments shown on floor measure rate per second gas is received during the evolution period. Funnel-shaped gas intake collector (shown near electric furnace and ladle of molten metal) is held at safe distance by operator. The entire experiment was conducted under a special exhaust hood to prevent spread of air-borne emitters.

Science News Letter, August 5, 1950

MEDICINE

Milk with Aureomycin

➤ MILK, valued as a food, is gathering new laurels for itself in aureomycin treatment. Drs. Lloyd G. Bartholomew and Donald R. Nichols of the Mayo Clinic report. Used as an agent to control vomiting caused by aureomycin treatment, milk, as compared with other nausea-control agents, allows for the best absorption of aureomycin into the blood stream.

Patients receiving aureomycin are often affected by nausea and vomiting. To counteract the vomiting, aluminum hydroxide gels have been used in the past. However, recent studies demonstrated that the aluminum hydroxide hinders the absorption of the aureomycin into the blood stream.

To control vomiting, one glass of milk given with the aureomycin was most effective.

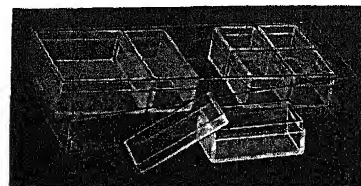
Of the 50 patients receiving this combination, only four experienced significant nausea and vomiting.

Further studies were carried out to see if the use of milk hindered the absorption of the aureomycin into the blood stream. One group received aureomycin alone, one group received aureomycin with aluminum hydroxide, and one group received aureomycin with milk. The levels of aureomycin in the blood serum after the administration of 750 mg. of aureomycin with 200 cc., or one glass, of milk were approximately the same as the levels obtained when 750 mg. of aureomycin was given alone to fasting patients.

Except in an occasional case, vomiting is controlled by drinking one glass of milk

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ANTHROPOLOGY

Search for Missing Link

The exclusive coverage of the anthropological expedition to the "nursery of man" is concluded. Map showing high points of expedition in SNL, July 29, p. 75.

By DR. HENRY FIELD

SHARJAH, TRUCIAL COAST, PERSIAN GULF—This ancient Pirate Coast, known for a century as the Trucial Coast, is ruled by seven independent sheiks.

This area is two hours flight from Bahrain island and we arrived here in an R.A.F. DC-3 with bucket seats.

The sheiks rule the foreshore, but the interior is relatively little under their sway.

The mysterious Schuhuh tribe live in caves up a narrow creek. They do not like foreigners. They have never been photographed or studied.

The British guide the seven sheiks in their foreign policy. There are no police. There is no rule except that of each sheik. There are no telephones. The principal source of revenue is pearl-fishing. I went out to the fleet to watch the divers at work. Each man fastens a nose clip in place and with a lead weight between his toes he sinks to the ocean floor, at this point 30 feet deep. About two minutes later he surfaces with a handnet full of oysters. This is indeed hard work for relatively little. The average diver makes about \$10 per month from June to September, not much in relation to the cost of pearls on Fifth Avenue or State Street.

The waters along the Trucial Coast abound in fish. The nets are usually full. Sail fish are plentiful; here they are reported to be the largest in the world.

From an archeological standpoint, there are two ruins, one at Ras al Kheima, the other on the island of Umm an-Nar. These are probably Portuguese ruins but time did not permit me to visit them. In the market places of Sharjah and Dubai I saw the customary medley of racial types, worthless from the point of view of the physical anthropologist. In the interior at Bireima Oasis, on the mountain slopes of western Oman or among the true Bedouins there is much to be done, but the inaccessibility and the almost certain lack of cordial cooperation on their part would make this task extremely difficult, even during the winter months.

The Trucial Coast is my farthest point from Harvard. It is now time to start for home via Bahrain and across Saudi Arabia to Beirut.

Ibn Saud at Last

DHAHRAN, SAUDI ARABIA—When I stepped ashore from an Arabian-American Oil Co. launch at Al Khubar on the Per-

sian Gulf, it was a great moment for me. For more than 12 years I had wanted permission to begin anthropological researches in the Kingdom of Ibn Saud, Lord of Arabia.

Through the mediation of Assistant Secretary of State George C. McGhee and Ambassador J. Rives Childs in Jidda, permission was granted for me to land at Al Khubar and proceed to Dhahran where I was the guest of the Arabian-American Oil Co., known as Aramco.

The following day I was driven by Dr. Willard C. Beling to the ruins of a large city a few miles southeast of Dhahran. Here on the surface lay hundreds of broken potsherds and shellheaps. Within an hour we had collected a representative series for the Peabody Museum at Harvard.

Since we were out in the middle of a good old-fashioned sandstorm, locally called shemal (with the addition of a few well-chosen American epithets), our progress was slow. Our eyes were filled with sand which swirled around so that it was hard to see our shoes. The wind was blowing at 40 miles per hour and the shade temperature was about 110 degrees—not ideal conditions for scientific research!

The shellheaps were covered with oysters—probably the refuse of ancient pearl-fishers or oyster-frys. The pottery was ornamented with designs and some of it was glazed. Fragmentary glass bracelets were also seen.

This ruin, known as Ain as-Saih, must have been an ancient city on the shore of the Persian Gulf. Many travelers have visited these sandy mounds. Nearby a few palm trees struggle against the sand which sweeps on relentlessly.

No digging was possible even if the dust had not been blowing, for my permit specifies clearly that only surface material shall be collected on this brief reconnaissance along the Trans-Arabian Pipeline called Tapline.

The sherds from Ain as-Saih will form a welcome addition to the Peabody Museum study collections. Here comparative material is being collected from throughout Southwestern Asia. The sherds themselves are valueless, but as the collection grows in representative sherds from a wide range of localities it becomes possible to assign dates to new material. This side of research is never seen by the public. However, its usefulness is readily understood.

Future work at Ain as-Saih may reveal its ancient name and its place in the his-

tory of the Persian Gulf, an area which has long been occupied. First came the ancient dwellers of Mesopotamia and Persia, later the Phoenicians and Arabs. Even Chinese junks sailed these waters, long renowned for their pearl-fisheries.

A Page from Bible Days

AL GAISUMAH, SAUDI ARABIA—Along a now dry streambed wadi have moved countless camel caravans through several millennia. The village of Hafar al Batun, to which I drove with John C. Kelley, lies on one of the main lines of migration between Baghdad and Rujadh, capital of Saudi Arabia.

A flight from Dhahran, with a brief landing at Mishaab, was across a flat, unbroken wilderness, and it brought me to Al Gaisumah, really into the depths of Saudi Arabia at last.

As we approached the famous village near here we saw the plain strewn with about 400 black tents of the Bedouins. Beyond lay the fort with its crenelated battlements and towers. Hundreds of camels, sheep and goats were being watered from the many 100-foot wells. Our arrival in a cloud of flying dust disconcerted quite a few of the camels, their snorts being obvious distaste at the approaching wheeled monster.

We stopped to drink a cup of bitter, black coffee brewed for us by Sheikh Ibn Muses of the Muteir tribe. Here under the black tent we were back in the days of Abraham, for Bedouin life has remained but little altered during the past 5,000 years.

Looking around the little circle squatting on the rug-covered ground I observed that these Bedouins belong to the basic Mediterranean stock. They have changed little in type, guarding their racial purity with the strictest of sanctions. The Bedouin women do not veil, their faces are ornamented with simple tattooed designs. The teeth of these Bedouins are remarkably good for they eat little sugar and no canned food.

We returned to Al Gaisumah, this being the name of a yellow-flowered shrub abundant in this region. Here is Station No. 3 of the world's largest construction project, the \$300,000,000 30-inch pipeline to carry the oil from Abgaig near the Persian Gulf to the ancient town of Sidon, which according to Matthew (XV:21) was visited by Jesus. Such is the twentieth century blending of the ancient and the new.

Flint Flakes Found

RAFHA, SAUDI ARABIA—On a low hill near here, where ancient man could camp secure from surprise attack, we have found a few flint flakes obviously chipped by human hands. This is the first link in northern Saudi Arabia with the men of the

Old Stone Age. The evidence was thin but positive.

We had driven along the 30-inch steel snake, known as the Trans-Arabian Pipe Line, from Al Gaisumah to the next pump station to the northwest called Rafha. The hill was an obvious place to look for traces of Stone Age man whose handiwork I have been pursuing for 25 years from southwestern Sinai to the Caucasus mountains.

In nearby Jumaima, hundreds of camels were being watered by the Shammar Bedouins, whose black tents dotted the plain. At Jumaima there was plenty of water, but the wells were deep and the big stone cistern overcrowded with the drawers of water.

This cistern lies on the famous Darb es-Zobeida, the main camel track southward from Baghdad to Mecca. This road is named for the beautiful Zobeida, consort of Haroun el-Rashid. This woman encouraged the building of water cisterns and rest houses all along the pilgrim way.

It is safe to assume that her name is blessed among the hot and tired pilgrims, for this land is indeed inhospitable—even to those on a sacred mission.

We turned south about 25 miles to visit the ruins of Zabala, one of the most famous halting-places on the Darb es-Zobeida. Many Arabic authors describe this haven on the Pilgrim road. For example, during January, 925 A.D. the Carmathians defeated the soldiers who were guarding Zabala; only a few of the Persian pilgrims on their way to Mecca escaped.

The main courtyard of Zabala is now enclosed by crumbled walls. In the center lie six fresh Bedouin graves, piled with fallen rubble. Glazed potsherds were collected for the Peabody Museum at Harvard; this glazing is now a long-forgotten art.

To the north lie three wells, each more than 175 feet deep. The deepest is rectangular and faced with dressed stone. At night it would not be difficult to plunge into this well either on foot or in a car, for the top is flush with the ground. This would indeed be a mysterious disappearance.

Roman Fortress Discovered

TURAI, SAUDI ARABIA—On a lonely hilltop near the road along the Trans-Arabian pipeline on the way to this Station VI, we found and collected stone implements of Paleolithic type, evidence of stone age man which links with the other discoveries in Jordan and Iraq.

But a newly discovered Roman fortress was also an important site explored, for it is the most eastern outpost of the Roman empire.

The ruins lie 10 miles to the southwest. Here at the western end of a large mud-flat, now dry as a bone, lay a catchment basin faced with dressed basalt boulders. Nearby stood the lower portion of a gateway leading into a rectangular courtyard

beyond which were the foundation stones of six rooms.

No one else built like the Romans. Their superior handiwork remains a marvel of the centuries. We made a ground-plan of the gate and courtyard and searched in vain for an inscription. Pottery was collected on the surface of the ground. Stretching for several acres were piles of basalt meaningless without an aerial photograph.

This newly-discovered Roman fortress must have formed a link in the chain of outposts protecting the town from the desert. To the northwest lies Qasr el-Azraq, to the north Qasr el-Burqu, long described as "the most eastern outpost of the Roman Empire." Now Qasr ed-Dauguera takes this as its rightful place.

Perhaps in the long-veiled Wadi Sirhan to the south lies another unknown Roman outpost? Future exploration alone will decide.

We drove across the hot low-rolling gravel and sand-covered hills to the southwest searching here and there for prehistoric stone implements, collecting plants and chasing the elusive lizards.

We passed through a wind-swept canyon where dozens of basalt blocks showed the amazing effect of wind-action, called "diakanter." These blocks were trimmed into neat, triangular shapes by the continual etching of the wind. Driving by a huge salt lake, whose surface glistened in the distance, we came around a bend over a hill and there before our eyes was the oasis of Qalyat al-Milh on the fringe of the great Wadi Sirhan. To the right stood a fort with four corner towers, reminiscent of "Beau Geste."

A Negro servant of the Emir welcomed us for his master was sleeping during the heat of the early afternoon; moreover, it was Ramadan and all were fasting until sundown.

Beyond lay the flat-topped village bordered by many palms, none of whose branches swayed in the listless air. On the high hill above was a fort with a broad track leading to the summit.

We returned to Turai in the cool of the evening for there the thermometer read only 98 degrees in the glow of the sunset.

Earliest Commercial Article

BEIRUT, LEBANON—Probably the flint we discovered on the slopes of a blacker-than-black hill at Tell el-Hibr near the Saudi Arabian border was the earliest article of commerce.

On the southern slope of this hill, rising about 500 feet above the level of the plain, were quantities of flint flakes chipped by human hand. This flint, some of it honey-brown in color, is the best quality I have ever seen in this part of the world. Here the prehistoric flint-knapper must have truly enjoyed his work.

A parallel case of flint figuring in trade is in Western Europe. Flint from the famous quarry at Grande-Pressigny in France has

been found hundreds of miles away—presumably by trade in Neolithic and later times.

Tell el-Hibr thus forms an important link in the chain of evidence for the distribution of Paleolithic Man in Southwestern Asia.

A Trans-Arabian pipeline Navion plane took me to Beirut.

As we flew northwest we soon crossed the undemarcated boundary between Saudi Arabia and the Hashimite Kingdom of the Jordan. From 2,000 feet I waved au revoir to the kingdom of Ibn Saud, grateful indeed to him for allowing me to be the first anthropologist to make a reconnaissance survey in his country which is so rich in the cultural history of mankind.

We stopped at Station VI A to pick up a sick man and his friend. Flying low over eastern Jordan we could see many ancient villages with their circular enclosures on the edge of now-dry streams. Some of these near mudflats were fishing communities. From the abundance of these stone circles this part of Jordan must have supported a relatively large population based on the former fertility.

Leaving the high, forbidding mass of Jebel ed-Drus on our right we flew over Deraa in southern Syria, where the Israelites slew Og, king of Bashan (Number XXI:31-35). Ahead loomed Mount Hermon, an imposing mass.

The little Navion seemed to strain to fly higher, 8,000 feet, 8,500 feet, 9,000 feet. To my untrained eye, we were not going to make it. I shouted to the pilot "Are our wheels up? I'm afraid we will touch the top." He smiled reassuringly as he tapped the altimeter. "Five hundred feet to spare," he yelled. He was quite right.

We landed at Beirut exactly to the minute on time.

The expedition was finished except for the hard work of getting the specimens packed and on board the ship and the researches yet to be done.

I am sailing on the American Export SS "Exeter" with 18 packing cases of specimens bound for the Peabody Museum at Harvard.

Since March 1 reconnaissance work has been done in Syria, Iraq, Persia, Kuwait, Bahrain, Qatar, Trucial Oman and Saudi Arabia. Some gaps had been filled, some discoveries made.

Return of Science

➤ BAGHDAD, IRAQ—Iraq, once called Mesopotamia, stands in the center of southwestern Asia on the crossroads of Asia, India, Africa and Europe. For that reason the birds, animals and insects of Iraq are of unusual interest.

This is so because they have many varied forms, ranging from those to be found on the mountains in the north to the alluvial plain in the center and south. On the mountains live the ibex, deer and bear. On the plains roam gazelle, jackal, fox, hyena and, near the Twin Rivers, wild boar.

Hundreds of species of birds, insects and plants flourish in the wide climatic range. The geology of Iraq is of primary importance because of the vast reserves of revenue-producing oil.

The first zoological collections were made in 1918 by the members of a British Expeditionary Force. The specimens were identified at the British Museum, where the majority of the type collections from southwestern Asia are to be found.

In 1927-1928, as leader of the Field Museum North Arabian Desert Expedition and again in 1934, I collected many series of animals and plants, now in Chicago.

However, it has long been obvious that a natural history museum should be founded in Baghdad so that not only specimens could be centralized, but also publications could be issued in Arabic and English. I discussed this general outline in 1934 with the late King Ghazi, who showed an enthusiastic response.

In 1946, the Regent opened the Natural History Museum with zoological, botanical and geological sections, as well as a room devoted to the study of evolution. The director, Dr Bashir E Allouse, has just published "A HANDLIST OF THE BIRDS OF IRAQ" so that the Iraq government is now for the first time sponsoring scientific research and publications.

In the garden of the museum, under a date palm, about 20 turtles swim around or rest in the shade. These were collected by us in Kurdistan and presented by the Peabody Museum-Harvard Expedition.

Thus science has come back to a nation which 2,500 years ago led the world in mathematics and astronomical research.

Ancient "Whodunnit" Tackled

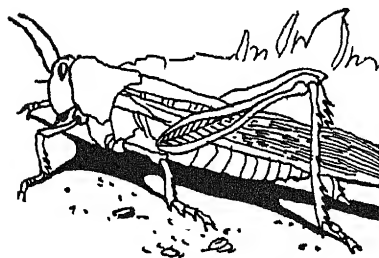
NIMRUD, IRAQ—Evidence of what may have been an unsolved murder committed 3,500 years ago was just unearthed at Nimrud, near Mosul, Iraq, when the skeletons of two young boys were found buried under the floors of a room in King Ashurnasirpal's palace.

Solution of this ancient "Whodunnit" has been undertaken by Agatha Christie, mystery story writer, who, as wife of Prof.

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ENTOMOLOGY NATURE RAMBLINGS



Grasshoppers

➤ IN Aesop's fable of the ant and the grasshopper the ant is made out to be sober, conscientious, and hard-working, with a provident eye for the rigorous winter ahead. The grasshopper is painted as a frivolous idler who fiddles the summer away with no care for the morrow.

Actually Aesop was more of a moralist than a naturalist. As a tale-teller with an axe to grind, Aesop may also have harbored an unwitting prejudice against a creature endowed with a built-in musical instrument. For grasshoppers, although far from idle, do produce a rhythmic sound that is enchanting or irksome, depending on your point of view.

The male grasshopper can fiddle or keep silent at will. When it feels like sounding off, it rubs the inside of the hind legs

against the wings, producing a rasping or crackling sound. It can do this one leg at a time or both together. The female is unable to fiddle.

Katydid and crickets, which are closely related to grasshoppers, are even more musical. They produce a louder tone and a more varied phrase. Their songs, with day and night variations, have been written down in musical notation. It might be an interesting experiment to go out into the fields with a violin and play the katydid song and see what kind of back-talk you provoked.

But grasshoppers are neither all music nor all frivolity. Their business in life is to eat and to reproduce, and they allow their fiddling to interfere with neither. Grasshoppers are vegetarians, and sometimes when they become extremely numerous they move forward in great swarms, ruining crops and devastating the countryside. The locust plagues described in the Bible were caused by a species of grasshopper.

If grasshoppers sometimes show a partiality for the same foods that man likes, man has frequently returned the compliment in a left-handed sort of way by feeding in turn on the grasshoppers themselves. In many parts of the world roasted grasshoppers are eaten as a food. The Japanese have found that they are even more nutritious than fish.

Some American Indians used to eat grasshoppers, and at least one contemporary American naturalist, Wilfrid S. Bronson, has broiled and eaten them out of scientific curiosity. He says they taste like lobster.

Science News Letter, August 5, 1950

Max Mallowan, is one of the technical staff of the expedition sponsored by the British School of Archaeology. On this problem she will have to work without the aid of her detective master mind, mustachioed Hercule Poirot.

Finding the bones of the two boys hidden in the royal palace was reminiscent of the death of the two little princes in the Tower of London. Mrs. Agatha Christie Mallowan regards the problems of unraveling the past more fascinating than modern mystery fiction.

Other rooms, halls and passages of this palace were decorated with winged bulls and lions and long, inscribed texts in cuneiform which listed the many titles of King Ashurnasirpal. It was this king who, about 330 B.C., restored what was then Calah and now is Nimrud, as capital of Assyria. In Nimrud, Prof. Mallowan and his staff have excavated great winged bulls weighing many tons.

In Nimrud also was found the site of what was probably the world's first and largest zoo. Here the kings of Assyria kept thousands of animals. Visitors came from near and far to see the curious animals from Asia and Africa. Particularly

popular then, just as in the modern zoos today, were the trumpeting elephants.

Science News Letter, August 5, 1950

INVENTION

Milking Chore Eliminated: Device Holds Cow's Tail

➤ COWTAIL holder, on which the government recently issued a patent, will ease the job of the hand milker in fly-time and eliminate the small-boy former chore of holding the tail while daddy draws the milk. Farm-raised city men, as well as present cow owners, will appreciate this device.

It is a simple gadget with two arms pivoted in the center like ordinary shears. A spring between the handle ends to the rear hold the jaws of the forward part closed. To use, these jaws are opened, the hairy part of the tail inserted between pads, then closed on the cow's leg. The jaws hold firmly but without disturbing the composure of the animal.

The inventor is Albert J. Kline, New Douglas, Ill. For his efforts he received patent 2,513,494.

Science News Letter, August 5, 1950

Books of the Week

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BIBLIOGRAPHY OF RAILWAY LITERATURE—*Association of American Railroads*, 4th ed., 48 p., illus., paper, free upon request to publisher, Transportation Building, Washington 6, D. C. A list of many of the books and stories that have been written about railroads and railway travel

THE CASTLE OF IRON A Science Fantasy Adventure—L Sprague de Camp and Fletcher Pratt—*Gnome Press*, 224 p., \$2.50. A science fiction story based on a theory that there were many possible worlds existing side by side in time, separated from us only by limitations of the mind.

COMPOSITION OF FOODS—RAW, PROCESSED, PREPARED—Bernice K Watt and Annabel L Merrill—*Gov't. Printing Office*, U. S. Dept. of Ag Handbook No. 8, 147 p., illus., paper, 35 cents. A handbook presenting three tables of data on the proximate composition of foods.

DESIGN AND OPERATION OF DRAINAGE PUMPING PLANTS—John G. Sutton—*Gov't. Printing Office*, U. S. Dept. of Ag Tech Bull. No. 1008, 81 p., illus., paper, 25 cents. A report of a study made of 17 representative drainage pumping plants in the upper Mississippi Valley.

EDUCATION OF THE GIFTED—Educational Policies Commission—*National Education Association* 88 p., paper, 35 cents. Stressing the importance of recognizing and utilizing talent (See SNL, June 17, p. 374)

GEOLOGIC DESCRIPTION OF THE MANGANESE DEPOSITS OF CALIFORNIA—Parker D. Trask and others—*State of California, Division of Mines*, Bull 152, 378 p., illus., \$2.75. A detailed report of the individual manganese deposits in California.

GRAY'S MANUAL OF BOTANY A Handbook of the Flowering Plants and Ferns of the Central and Northeastern United States and Adjacent Canada—Merritt Lyndon Fernald—*American Book Co.*, 8th ed., 1632 p., illus., \$9.50. The first new edition of this reference manual to be published since 1908.

THE HYDROGEN BOMB AND INTERNATIONAL CONTROL TECHNICAL AND BACKGROUND INFORMATION—*Joint Committee Staff on Atomic Energy*, 41 p., illus., paper, free upon request to publisher, Washington 25, D.C. Printed for the use of the Joint Committee on Atomic Energy.

INFRARED DETERMINATION OF ORGANIC STRUCTURES—H M Randall and others—*Van Nostrand*, 239 p., illus., \$10.00. A monograph on how to determine molecular structure by using infrared spectra. For chemists, biochemists and physicists. There are 354 black and white plates

MANAGEMENT OF NATURAL SLASH PINE STANDS IN THE FLATWOODS OF SOUTH GEORGIA AND NORTH FLORIDA—Robert D McCulley—*Gov't. Printing Office*, U. S. Dept. of Ag. Circ No. 845, 57 p., illus., paper, 20 cents. A guide for managers of stands of natural slash pine.

PREJUDICE IN TEXTBOOKS—Maxwell S. Stewart—*Public Affairs Committee*, 31 p., illus., paper, 20 cents. A summary of a study made

by a committee of the American Council on Education on the textbooks and courses of study used in our schools.

THE PRINCIPLES OF SCIENTIFIC RESEARCH—Paul Freedman—*Public Affairs Press*, 222 p., illus., \$3.25. A guidebook for people about to embark on scientific research. Such topics as research and society, research and philosophy and general conditions of experimentation are discussed. American edition of an English book, listed SNL, Feb. 11, 1950

THE REMARKABLE EXPLOITS OF LANCELOT BIGGS SPACEMAN—Nelson Bond—*Doubleday*, 224 p., \$2.50. The adventures of Lancelot Biggs, mate of the spacelugger Saturn. Fiction, of course.

THE SCHOOLS OF CORPORATE REFORM—Harold Gill Reuschlein—*University of Pittsburgh Press*, 117 p., \$2.50. A study of the pros and cons of corporations.

TODAY'S BOOKS FOR CHILDREN AND TOMORROW'S WORLD—Gladys Murphy Graham—*American Association of University Women*, 22 p., illus., paper, 20 cents. A small brochure reviewing children's books written about life in other countries. Some fairy tales are included

Science News Letter, August 5, 1950

GEOLOGY

Use Natural Gas to Free Liquid Fuels for Military

➤ MORE liquid fuels for military uses are available, without disrupting home and industrial needs for heat and power, with the greatly increased use of natural gas that has come about particularly during the past decade

Natural gas now supplies nearly 20% of the nation's commercial energy consumption, according to Dr James J. Parsons of the University of California. He is the author of a timely publication issued by the university entitled *THE GEOGRAPHY OF NATURAL GAS IN THE UNITED STATES*

For each 42-gallon barrel of crude oil produced in the United States today, the equivalent of an additional 25 gallons comes to the surface as natural gas or its contained liquids, he states. Both net and and marketed production of natural gas have more than doubled in less than a decade.

Use of natural gas for fuel purposes in other countries is small in comparison with the tremendous consumption in the United States as a result of this expansion during the past 10 years. This country used some 140 billion cubic meters in 1948, and is using much more now. The only other countries that produced more than one billion cubic meters for use as fuel were the Soviet Union, Canada, Romania, and possibly Venezuela. Moscow is now sup-

plied with natural gas by a 530-mile pipeline from Saratov on the lower Volga

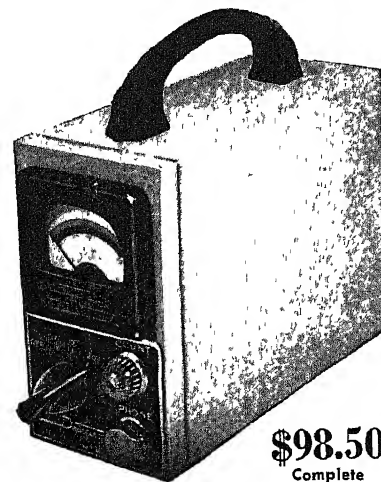
The United States has ample supplies of natural gas to last for years. In 1948 and again in 1949 new discoveries and revisions of existing reserves were more than double the production of natural gas for the year, Dr. Parsons declares. "It is not widely realized that in equivalent heat units the proved and recoverable reserves of natural gas exceed proved petroleum reserves by a substantial margin"

Texas, Oklahoma and Louisiana contain the largest American known reserves. These three states together are responsible for 71% of the total production for 1949. Transportation is entirely by pipeline. Giant pipes are carrying Texas Panhandle gas to the Great Lakes area. Lines from southern Texas are supplying the East as far as New York City and will soon extend into New England

Science News Letter, August 5, 1950

Radioiodine, chemically iodine 131, has been found valuable in treating one out of four advanced cases of thyroid cancer

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⚙️ **MEAT TENDERIZER** from papaya is available in "tea bag" style of envelope for easy use in the home. One bag in a glass of tepid water makes enough material to tenderize 40 pounds of meat and does so at a cost of less than a cent per pound of meat.

Science News Letter, August 5, 1950

⚙️ **BICYCLE HEADLIGHT**, automobile sealed-beam type, throws a block-long beam of light through a clear lens which gives a narrow beam like that of a giant flashlight. It operates in a case with either three or six regular flashlight batteries.

Science News Letter, August 5, 1950

⚙️ **VINYLLITE PLASTIC** tablecloths are colorfully printed with the appearances of fine black linen. No ordinary washing is needed as they can be easily cleaned with a damp cloth. No ironing is needed and they are available in seven colors.

Science News Letter, August 5, 1950

⚙️ **SHRIMP CLEANER**, to remove the body from the shell, has a plastic handle which tapers to a point. This point is inserted under the shell at the vein hole, as shown in the picture, and thrust straight



back to separate the shell from the meat so that the shrimp can be rolled out.

Science News Letter, August 5, 1950

⚙️ **COVER FABRIC** for presses used by the dry cleaner is made of asbestos blended with cotton and rayon. Because of the natural heat-retaining qualities of asbestos, the fabric offers a superior finishing surface,

which results in quick drying and no shine on the clothing.

Science News Letter, August 5, 1950

⚙️ **STREET LIGHTING** recorder, for measuring street illumination, is an "electric eye" on wheels that trails an automobile and sends light intensity information to a registering device in the car. Accurate measurements of various amounts of light along the road can be taken at speeds up to 20 miles an hour.

Science News Letter, August 5, 1950

⚙️ **IMPROVED HECTOGRAPH** is designed for office, school or home use, and will turn out 100 copies of typed or written pages at a single run. The gelatin used is chemically treated to assure clean and clear copies. Special hectograph carbon sheets and writing ink come with the device.

Science News Letter, August 5, 1950

⚙️ **GLASS REINFORCED** paper contains continuous glass fibers swirled between two plies of kraft and then bonded under heat and pressure within waterproof outside layers. This tough, strong, non-deteriorating product has uses ranging from packaging to covering haystacks.

Science News Letter, August 5, 1950

Do You Know?

Stuttering occurs in about 1% to 2% of the population

A person weighing 150 pounds on earth would weigh 24 pounds on the moon

Christopher Columbus found West Indians playing with rubber balls made directly from latex, the milky sap of rubber plants

Nearly one-third of the victims of lightning are persons taking shelter under isolated trees during lightning storms.

When cows are switched from hard water to an aerated soft water, milk production greatly increases, it is claimed.

Venezuela, seven times the size of New York State, has 5,000,000 people but land enough to support easily some 45,000,000.

Porcupines are fair swimmers; because of their hollow air-filled needles and their plump bodies they float high in the water.

City folks are in less danger of lightning than rural people; the steel frames of tall buildings act as lightning conductors.

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THE WEEKLY SUMMARY OF CURRENT SCIENCE



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\$5.50 A YEAR

Subscription Department, National Research Council

VOL. 58 NO. 7 PAGES 97-112

NUCLEAR PHYSICS

From Now On: The Atom

A law which will apply to the universe and to the submicrocosmos is in the offing. New concepts for the study of the atom will be introduced.

By WATSON DAVIS

Twentieth in a series of glances forward into science.

➤ THERE really are "two worlds" among the atoms. The laws that govern the universe down to the fringes of the atoms themselves do not hold good in the hearts or nuclei of the atoms.

No puzzle is more troublesome just now than to try to figure out the action within this terrifically concentrated atomic core, made up of protons and neutrons. An assorted variety of other particles, called mesons, appear and disappear in nuclear collisions.

Just visualizing the atom is a strain upon the imagination. Suppose it is enlarged a billion times. The empty space in which the electrons roam would be about the size of a basketball. The familiar idea is that these electrons are like planets in a solar system. The nucleus, or core, would be a tiny grain of sand. Yet the bulk of the matter of the atom—and the universe—is in the nuclei, for each proton and neutron is nearly two thousand times the mass of an electron. There are in general as many electrons in the outer part of the atom as there are protons within. This balances the charges—positive for the protons and negative for the electrons.

The neutrons are electrically impartial, unattracted by matter. Theoretically they go on for immense distances once they get started, and almost all matter is "transparent" to them. The neutrons are the trigger particles of the uranium-plutonium fission atomic bombs. They explode a fissionable atom when they hit it. They start the action that changes mass into energy. That is one of the reasons that such attention is being paid to them.

Containing the bulk of the mass of the universe, the nucleus is the prime atomic powerhouse. Immense particle accelerators, flinging fragments of atoms at energies of billions of electron volts, are being built to attack it and learn its actions and secrets. Immensely curious about the practical as well as the theoretical results of such experiments, the Atomic Energy Commission is investing millions of dollars in such atom smashers, each with a special kind of job.

The cosmic rays have energies higher than those produced by any machine now building and any man can hope to build. Scientists, with aid of balloons and high places, arrange for thousands of photographic plates to be exposed to catch in-

frequent but revealing atomic smashes.

Some of the most advanced mathematical physics is directed toward the problem of the nucleus—the "core" problem of modern physics. To a non-mathematician what is written in formulae is unreadable. The theory is usually beyond most experimental physicists.

There is quantum electrodynamics which is concerned with the interaction of the electron, the particle of electricity, with radiation. This idea stems from Dr. P. A. M. Dirac, modern English physicist, and works out well, but the older Maxwell the-

ory of the nineteenth century considers radiation, including the electron, as waves, and it too works. Getting such divergent theories together is the task of modern mathematicians and physicists.

For the future, you may expect:

A. New particles that will be considered "fundamental" or "elementary" in the sense that they have existences, no matter how fleeting in the nucleus of atoms. These may be more mesons, entities that seem to "play" catch, as one scientist put it, among the more lasting protons and neutrons.

B. The larger atom-smashers now building with their immense energies may so explore the heart of matter that the way the nucleus is put together will be better understood, bringing the possibility of more atomic transformations of practical importance.

C. A mathematical concept or law that will apply to the universe as a whole as well as to the submicrocosmos of the atom will be worked out.

Science News Letter, August 12, 1950

ASTRONOMY

"Shooting Star" Month

➤ THIS month is one of the best months of the year to look for "shooting stars" flashing across the night sky.

This is because the Perseids, the most conspicuous and dependable of the annual meteor showers, are visible during the first two weeks in August. The rate of seeing these brilliant "tracer bullets" from space increases slowly to Aug. 12, then falls off rapidly.

Most of the meteors will appear to radiate from the constellation of Perseus which rises in the northeast about midnight.

It is expected that about 50 "shooting stars" per hour can be seen on the night of Aug. 12 after midnight. Throughout the year the average for a single observer under the best conditions is ten an hour.

Since any one person's field of view is limited, there are actually many millions every night visible over the entire earth's surface. Smaller meteors, not visible to the naked eye, would considerably increase this total.

This year, fortunately, excellent observing conditions will prevail for the height of the shower. New moon occurs on Aug. 13 in the United States, and therefore the moon will not be visible on Aug. 12.

The frequency of seeing meteors increases after midnight. The reason that more can be seen after midnight is that in the evening we are on the following side of the earth with respect to its revolution. We are, therefore, protected from the meteors, except those that overtake us.

In the morning we are on the forward side fully exposed to the bombardment from space.

Although these meteors are actually mov-

ing in parallel paths, they will seem to come from a point, because of the perspective. The same effect is given, for instance, by far-away railroad tracks that seem to converge to a point in the distance.

Meteors are solid, swiftly moving bodies, fused and mostly consumed in their flight through the upper atmosphere. Their trails are of very short duration, but their trains, hollow cylinders of phosphorescent expanding gases, are visible from a few seconds to as much as half an hour.

Science News Letter, August 12, 1950

On This Week's Cover

➤ THE new jet propulsion laboratory which has recently gone into operation at Beacon, N. Y., is believed to be the first large industrial jet laboratory to be financed entirely from private funds.

On this week's cover of SCIENCE NEWS LETTER, exhaust gases from gas turbine combustion, traveling at speeds of 1,000 feet per second and reaching temperatures of 1,600° Fahrenheit, turn exhaust pipe into brilliant cherry red color in nighttime jet research. Specially constructed quartz windows permit the scientists to study the combustor interior.

The new laboratory, owned by the Texas Company, can be used to test not only petroleum components but a wide range of organic and inorganic chemicals which possess remarkable power characteristics.

Science News Letter, August 12, 1950

MEDICINE

Life-Saver from Burns

Cortisone may prove to be stop-gap aid for the exhaustion of the adrenal gland which occurs in severe burns.

➤ **CORTISONE**, adrenal gland hormone famous for its beneficial effect in arthritis, may prove life-saving in cases of severe burns

The death rate can be halved if this hormone is given along with treatment for shock during the first critical days after the burn, it appears from studies by P. O. Crassweller, Dr. A. W. Farmer and W. R. Franks of the Royal Canadian Air Force Institute of Aviation Medicine and the Hospital for Sick Children of Toronto.

Their studies were made with mice. Because of the scarcity of cortisone itself, they did not use the pure hormone. Instead they extracted material with cortisone activity from human urine.

This was injected twice daily for the first four days after the burn in one group of 69 mice. These mice also were given serum albumin to control shock. The death rate for these mice after eight days was about 15%. Another group of 69 mice were given albumin for shock but no cortisone. At the end of eight days, more than twice as many of this second group, over 30%, were dead. And among mice that got no treatment for their burns, between 40% and 45% were dead at the end of the eight days.

Among the mice that died, the untreated ones survived, on the average, only eight hours. Those that got treatment for shock survived for 12 hours. Those that got cortisone plus shock treatment survived 19 hours.

Treatment for severe burns, the scientists point out, has improved greatly during recent years, due to new drugs for treating infection and plasma and albumin for overcoming shock. But there are still patients who recover from shock and have no infection, but die between the third and tenth days after the burn. This period is called the "toxic" period and there has so far been no satisfactory treatment for it.

These deaths, the scientists think, are due to exhaustion of the adrenal gland. The exhausted gland can no longer make enough cortisone. Giving the hormone would help tide the patient over this critical period until his own gland has recovered and can function again.

ACTH, cortisone's twin for arthritis treatment, would not help because this hormone, from the pituitary gland, acts by stimulating the adrenals to produce cortisone. If the adrenals are already exhausted, ACTH could not help and might make matters worse.

If cortisone is used for burn patients, the scientists warn, doctors must be careful not to give too much, particularly if the patients will need early skin-grafting operations.

Details of the study are reported in the *BRITISH MEDICAL JOURNAL* (July 29).

Science News Letter, August 12, 1950

PHYSICS

Universe Very Much as Now At End of First Half Hour

➤ **THE** first half hour of the life of our expanding universe found the world well started toward its present makeup, Dr. George Gamow, theoretical physicist of George Washington University, suggests in a report to the American Institute of Physics, published in its journal, *PHYSICS TODAY* (August).

Combining the mathematics of Einstein and the new information on how heavy atoms can be built up by combinations of neutrons and protons which has come from atomic energy studies, Dr. Gamow projects the line of development backward to the beginning of time as we know it. He deduces a very dense hot gas which began to expand sometime between one and four billion years ago.

Borrowing from the dictionary an extinct word "ylem" for this hypothetical material, he traces its expansion from the billions of degrees temperature with which it started, and the combinations of its neutrons and protons into the elements which make up the universe today.

Half an hour is enough time, Dr. Gamow calculates, to account for the small amount of uranium in the universe, in contrast to the large quantities of hydrogen and helium throughout the atmospheres of the stars. He finds no end to the expansion of the universe into infinity.

By collision of two particles at a time, Dr. Gamow can account for formation of the light elements through helium. There is a gap in the elements because helium, whose weight is 4, comes next in order to beryllium whose weight is 6. There is no element with atomic weight 5, although all other weights are represented among the elements.

Dr. Gamow thinks it more likely that a now unknown kind of carbon, mass 10, once existed, formed by collisions of lithium 6 successively with four neutrons or beryllium 7 with three neutrons one after the

other. Aside from this difficulty the formation of all the elements, in about the quantities that now exist in the universe, can be explained by processes now known.

Science News Letter, August 12, 1950

ASTRONOMY-ENGINEERING

Meteor Trails Trace Winds 80 Miles Above Earth

➤ **HIGH** above the earth where only meteorors and rockets are able to signal what is happening, there are variable winds ranging from a brisk 30 miles per hour to gales of 125 miles per hour.

These wind observations at 55 to 80 miles altitude have been made by a new electronic method of analyzing the drift of meteor trails devised by L. A. Manning, O. G. Villard, Jr., and A. M. Peterson of Stanford University's Electronics Research Laboratory, financed by the Office of Naval Research.

Meteors are small particles of matter that come into the earth's outer atmosphere and burn with a flash. They cause electrical disturbances due to their heat and these meteoric "smoke puffs" are efficient reflectors of radio waves and may be detected by radar-like method.

Although these disturbances last only a second or two, they drift like a smoke puff in the outer atmospheric winds, allowing them to be measured.

Knowledge of high altitude winds promise to help engineers designing rockets for peaceful or war purposes. Meteorologists



"SMOKE PUFFS" RECORDED— Prof. L. A. Manning of the Stanford Electrical Engineering Department examines a paper tape recording of the drift of meteoric "smoke puffs" detected by radio equipment. The drift gives clues to the speed and direction of upper atmosphere winds.

will use the new information in making weather forecasts, since facts gathered by balloons come from a level only about half as high.

The technical report of the research is appearing in the PROCEEDINGS OF THE INSTITUTE OF RADIO ENGINEERS (August)

Science News Letter, August 12, 1950

MEDICINE

Benemid against TB

➤ BETTER treatment for tuberculosis is expected through use of a new chemical called Benemid. The new chemical will step up the effects of PAS, a remedy already giving some beneficial results in treatment of the white plague.

Studies showing the possibilities to be expected from teaming these two chemicals are reported in Philadelphia by Drs. William P. Boger and Forrest W. Pitts of the Philadelphia General Hospital.

PAS, short for para-aminosalicylic acid, is being applied increasingly to the treatment of tuberculosis. It is sometimes used in conjunction with streptomycin. But the dosage of PAS now used, the Philadelphia scientists pointed out, is based on the amount the patients can tolerate, not on what is believed the optimum dose. Some TB specialists believe twice the dose now used would be desirable.

The Philadelphia scientists decided that PAS might be more effective if some way could be found of getting higher concentrations of it in the patient's blood without increasing the dose. One way might be to give a chemical that would slow its excretion from the body. Benemid seems to be the answer.

Tests on seven patients with tuberculosis showed that Benemid enhanced the concentration of PAS in the blood plasma two to four times.

"Therefore," Drs. Boger and Pitts state in their report to the journal SCIENCE

(Aug. 4), "Benemid may extend and greatly increase the efficacy of PAS in the treatment of tuberculosis."

Benemid's chemical name is p-(di-n-propylsulfamyl) benzoic acid. Sharp and Dohme make it under the trademark, Benemid, but it may get the nonproprietary chemical name of probenecid.

Science News Letter, August 12, 1950

METEOROLOGY

Predict Dry and Warm August for Southeast U. S.

➤ "APPRECIABLY drier and warmer than it was in July." That is what the Weather Bureau says it will be during August for the area east of the Mississippi and south of the Mason-Dixon line. However, New England will have a little better luck, if "slightly below normal" temperatures during August can be called that. Rainfall will be normal in the northeast.

"This was a very difficult forecast to make," Jerome Namias, chief of the extended forecast section of the Weather Bureau, said as he handed out his regular twice-a-month 30-day forecast. "The indications are not clear-cut," he said.

The dust bowl area of the country is in for some relief. The prediction for the Plains and Rocky Mountain states is "abundant showery rainfall." On the west coast, in the south, rainfall will be its usual

normal, which means very little, but the far northwest will have precipitation somewhat above normal.

Temperatures will be lower than normal for the central and northern Rocky Mountain states. Along the Great Lakes and elsewhere in the west, temperatures will be their usual August selves.

Science News Letter, August 12, 1950

Streptomycin is found by one research group to be the best of eight antibiotics for the treatment of the radiation produced by the atomic bomb.

SCIENCE NEWS LETTER

VOL. 58 AUGUST 12, 1950 No. 7

43,300 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W. Washington 6, D. C., North 2255 Edited by WATSON DAVIS

Subscription rates. 1 yr., \$5.50, 2 yrs., \$10.00, 3 yrs., \$14.50, single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925, 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

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MINING

Manganese Lack Drastic

Importation of manganese ore from Russia was cut to practically nothing in 1949. Only about 10% self-sufficient, this lack is an Achilles heel in our military might.

➤ NOT enough tanks, not enough guns, not enough armor for aircraft carriers. This is the down-to-earth nightmare which a single item on the suddenly critical "strategic materials" list—the lumpy ore of a metal called manganese—has brought to the men planning national defense speed-up.

Few people outside the government and the steel industry know of a Russian embargo which cut off the U.S. from its major source of manganese more than a year ago—and the desperate efforts which have been taken since then to fill the gap.

Special railroad ore cars were sent to South Africa, transportation experts went to India last year, in the attempt to make up the 350,000-ton annual U.S. import of manganese ore from Russia. This was suddenly cut to a mere trickle early in 1949.

The gap was closed, but this country is still vulnerable, for only about 10% of the manganese needs of the U.S. steel industry can be met by U.S. mines. The rest must be imported over long sea lanes.

There is no substitute for manganese in making steel, particularly the tough alloys needed for modern weapons of war. More manganese goes into steel than any other metal other than iron itself. If the supply were suddenly cut off, American steel furnaces would cool and close down.

Russia is self-sufficient in manganese. The U.S., far from that happy state, has been trying to find ways to boost its own output. We have low-grade ore, but processing it is expensive. Few companies have been able to meet competition of imported ores. The Senate is considering a bill which would aid rapid development of our own deposits.

The U.S. Bureau of Mines last year did a lot of research on ways to recover manganese from the slag piles outside open-hearth furnaces. There is theoretically enough manganese in these waste heaps to make up the amount we formerly imported from Russia, and to make this country 50% self-sufficient.

Government geologists drilled tunnels into hot, dusty, waterless Artillery Peak in Arizona and found vast reserves of manganese. But again they were so low in grade as to be usable only in a real emergency.

If Russian submarines on the high seas were to create that emergency, the steel industry almost immediately would have to delve into U.S. stockpiles (how big these are is a secret). After they are gone, where the steel furnaces would get manganese for artillery and armor is the question now stalking the re-awakened American defense effort.

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top young scientific personnel. A significant proportion of scientific personnel is in the reserves.

Some manpower experts believe that, sooner or later, competition for personnel will have to be stopped and that a new federal agency will have to allocate men and women among all components of our war effort. They point to the lack of a backlog of unemployed, the high level of production and the foreseeable great needs of the military as reasons for believing that it will be sooner rather than later.

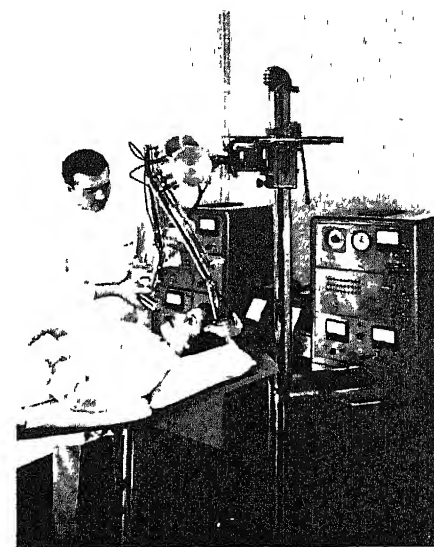
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MILITARY SCIENCE

Red-Conquered Korea a Dagger Confronting Japan

➤ IF Korea is completely conquered by Red forces, it will be a dagger pointed at the heart of American-occupied Japan.

History and geography show that Korea is by no means only an out-of-the-way place suitable for a preliminary testing of American strength and reactions. Ever since Japan came out from isolation in the 1860's, Korea has been the subject of a life and death struggle between Russia, China and Japan and the key to control of a vast



ATOMIC ROBOT—The "Isotron," a weird looking chromium monster with flashing lights and electronic brains, helps to pinpoint brain tumors which have baffled expert diagnosticians. Making skull incisions needless, the patient is simply given an injection of a radioactive isotope. The "tracer" accumulates in the tumor tissue and gives out messages which are received by two Geiger counter arms. Readings are taken at 32 spots and then the evidence is considered.

GENERAL SCIENCE

Manpower, Pro and Con

➤ PRESIDENT TRUMAN will soon be forced to decide a top-level quarrel between the Pentagon and the National Security Resources Board over the utilization of manpower. Science Service has learned.

Being dragged to his desk for decision are two schools of thought about the draft and the induction of reserve officers. Some influential top brass want as few deferments as possible, not caring whether the nation's laboratories and industries are stripped of precious scientific personnel. Leaders of science and NSRB Chairman Stuart Symington are working to see that skilled manpower is allocated to the job it can do best for the country, whether it be in service, in industry or in university laboratories.

In the opinion of those who are plugging for an all-out view of manpower rather than the Pentagon view, the manpower muddle has become worse instead of better recently.

The following things, have happened, or have been prevented from happening:

1. A committee of Selective Service that spent the last three years drawing up a program for deferment of those physicists, chemists, biologists and others who would be of more use as civilians has seen its plan shelved until September at least.

2. Only a stop-gap plan to prevent calling up of key scientific personnel who are members of the reserve has been approved.

3. A long-range, overall manpower program being worked out by planners in the National Security Resources Board has been held up by the military.

4. Forces on both sides are preparing to go to the President.

It is even more likely now that many of our great industrial laboratories, upon whom we will depend for new weapons, will be denuded of up to one-third of their

area of Asia and millions of square miles of Pacific waters.

Willy-nilly, the United States, by occupying Japan, must take over Japan's attitude about Korea. Perhaps one reason we decided to fight the Communists in Korea was that, after five years of responsibility for Japan, we have absorbed Japan's long-held preoccupation with Korea as the key to Asiatic dominance.

Japan and China have fought and intrigued over Korea since recorded history began. In 1592 the Korea Straits, over which our troops in Korea are now being supplied, was the scene of the first of several historic naval battles in waters near Korea. There, after 300,000 Japanese troops had invaded Korea in an attempt to drive out Chinese influence, science defeated the Japanese. A Korean admiral invented the iron-clad ship and used several of them to sever the Japanese supply route and finally to defeat completely the Japanese effort to control Korea.

Today those same straits, little more than 100 miles wide, are the reason for anxious worry on the part of our admirals. Russian submarines and aircraft, based at both Vladivostok and Port Arthur in Manchuria, threaten American supply routes to our beleaguered troops in Korea.

Russia, China and Japan intrigued in a Korea bedeviled by a corrupt, autocratic government until 1894. China put troops in Korea. Japan put more troops in Korea. The Sino-Japanese war which resulted was decided, not by land fighting, but by a naval battle off the mouth of the Yalu River, which divides North Korea from Manchuria. Japan won.

Russia, Germany and France, in a triple intervention, however, wrested the fruits of victory from Japan. This "upstart" eastern nation was upsetting the balances es-

tablished by the western nations in Asia and was threatening to become a world power. Japan was forced to withdraw.

In the next 10 years Japan did emerge as a world power. What happened in Korea became important around the world. Britain signed an alliance with Japan. Japan's power became important as a factor in the pre-World War I relations between the European nations.

In those ten years, the cockpit was Korea. In a series of maneuvers too complicated to report, Russia and Japan contended for supremacy in Korea and Manchuria. The maneuvering led to the Russo-Japanese war of 1904-05 and one of the most decisive naval battles of modern world history—right in the Korean Straits.

Japan won again. She took over Korea completely. This time no alliance of European powers could wrest victory and dominance of Korea and Manchuria from her. This time her victory affected European affairs. Russia was demonstrated to be a weak power—no longer a brake on German ambitions. Japan was a power whose favor was to be sought. As a direct result she was permitted to take the mandated Pacific islands which our troops had to wrest from her in World War II.

In 1934 the contest between Japan and Russia had another test—a test which neither power was able to bring to a final conclusion. There were "border clashes" along the Manchuria-Siberia boundary.

Now, Russia has control of Manchuria and all of China. She has a modern navy, nothing like the two inept fleets which were successively defeated by Japan early in this century. We have replaced Japan as a power in Asia. But the contest is the age-old one—who shall control Korea.

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PHYSICS

Warning of Radiation

A "dosimeter" will help citizens to recognize dangerous levels of radioactivity and also will aid them in finding the best way out of the dangerous area.

➤ ATOMIC scientists in Pasadena, Calif., have invented a radiation "dosimeter" simple and rugged enough to be used by any one in a radioactive disaster area, small enough to be worn like a wrist watch or carried like a package of cigarettes.

Drs. Charles C. Lauritsen and Thomas Lauritsen of the Kellogg Radiation Laboratory at California Institute of Technology describe the proposed civil defense safety device in the journal *SCIENCE* (Aug. 4).

Their instrument is not being made in quantity; it is only a proposal. But in the semi-annual report of the Atomic Energy Commission, released recently, there is

mention of an "electrostatic dosimeter" invented by a scientist at CIT and reference to "further industrial development" of it.

In the world of the A-bomb and H-bomb, write the Lauritsens, "tremendous and altogether unprecedented quantities of dangerously radioactive substances can now be liberated in a single explosion, or manufactured in a nuclear energy plant and delivered in the form of radioactive poisons, producing radiation hazards of fantastic magnitude."

Their invention would equip the ordinary citizen with a way of recognizing dangerous levels of radioactivity and a sort of

radiation compass to find the best way out of the area of dangerous radiation.

A wheel similar to the winding stem on a watch provides the electric charge which powers the instrument. The level of radiation would be shown by the speed at which a needle crosses a simple dial.

Radiation is invisible and unfeelable. You can get a bad dose of it, even a killing dose, without knowing you are exposed. In atomic laboratories and A-bomb plants, workers carry photographic films and pocket instruments. But these must be checked by specialists at the end of the day. Other radiation instruments are delicate, complicated and expensive.

"It is conceivable that our armed forces have already developed satisfactory instruments (for civilian defense teams, rescue crews, etc.)," the California scientists say.

"But, for reasons that are not clear, such information is not available to the public. We can only proceed on the assumption that no fully satisfactory instrument for this purpose has so far been developed."

In the AEC report, six types of simple safety instruments for civil defense are listed as under development. None are available yet in any quantity, an AEC spokesman said.

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ENTOMOLOGY

War on Insect Pests Now Nation-Wide

➤ AS many as 35 airplanes a day, every day, are roaring low over Wyoming's grasslands and mountain valleys in an all-out war against the grasshopper.

Desperate Southern cotton growers are using poison dusts to battle billions of boll weevils.

The armyworm has marched over Maryland, Delaware, New Jersey, Pennsylvania and Virginia, and is attacking in Ohio, Oklahoma, Texas and California.

Reports such as these from the Department of Agriculture document the Battle of 1950 against the annual insect infestation, now in full swing.

Latest reports on the most numerous insect pests list the grasshopper, European corn borer, corn earworm, armyworm, alfalfa weevil, red mites, Mexican bean beetle, potato leafhopper, seed-corn maggot, Colorado potato beetle, potato flea beetle, cutworm, tobacco hornworm, boll weevil, cotton leafworm, cotton thrip and the screwworm as causing moderate to heavy damage across the nation.

Harried insect fighters have one comforting thought. It could have been much worse. Spring this year was cold and wet in many areas. Tremendous numbers of insect eggs which survived the warm winter were delayed and often reduced in numbers in hatching.

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PSYCHIATRY

Mental Disease Increases

Living under Communism has produced a great increase in mental illness in China. Workers are being steeped in the teachings of Marx, Engels, and Lenin.

➤ MENTAL illness has "remarkably increased" in China due to the rapid change of culture under communism, reports a Chinese psychiatrist in a letter to colleagues in this country.

The letter was not mailed in China and the name of the Chinese psychiatrist is being withheld at the request of his American colleagues to protect him from possible reprisal by the communist government in China.

The increase in mental illness, the Chinese psychiatrist reports, has been brought to the attention of the government and several psychiatric institutes will be organized.

"Based on Bolshevism, the revolution in China will affect the entire course of history and the traditional philosophy," reports the Chinese psychiatrist.

"Every worker is encouraged to study and learn the teachings of Marx, Engels, and Lenin. The idea is that unless one is well acquainted with these teachings and understands the historical development of society, he will be easily misled toward the wrong direction and also will not be able to handle his knowledge properly."

This extends to professional classes as well as workers. A month of such study is required in every college before the regular classes open. "Workers," presumably psychiatrists and other doctors, in the National Neuropsychiatric Institute must spend half of every day for two months in studying and learning Marxism, Leninism and similar writers.

"There is a tendency that psychiatry in China will be involved in revolution following the example of the Soviet Union and the characteristics of China," states the Chinese psychiatrist in his report to his friends in America.

"The revolution will be based on the Dialectic Materialism. We psychiatric workers in China are encouraged to study and analyze the psychiatric theories and find out how much is materialistically based. Those parts coming from the idealistic viewpoint will be expelled. The general attitude toward Freudian theories sounds unfavorable in the Socialist world."

The present attitude in China toward personality adjustment and criminals is described by the Chinese psychiatrist as follows:

"People are educated to apply mutual criticism and self-confession which are considered to be the most valuable weapons for improving one's personality.

"Thus the law offender is not always imprisoned as before, but he is asked to confess before the public, then is opened to criticism. If he is frank enough and accepts comments heartily, he is considered excusable and hopeful.

"This sort of education has been proved effective elsewhere," the Chinese psychiatrist comments, obviously referring to the Soviet Union and its satellite countries.

He states that even after a number of months he himself is "a little bit confused about the new environment" and finds it somewhat difficult to readjust himself.

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ENGINEERING

Aluminum Prefab Protects Soldiers from Wind, Cold

➤ COMPLETE protection from 100-mile gales and sub-zero weather is provided for soldiers by a new aluminum prefabricated building developed by the Army Engineer Research and Development Laboratories at Fort Belvoir, Va., in collaboration with Chrysler Corporation.

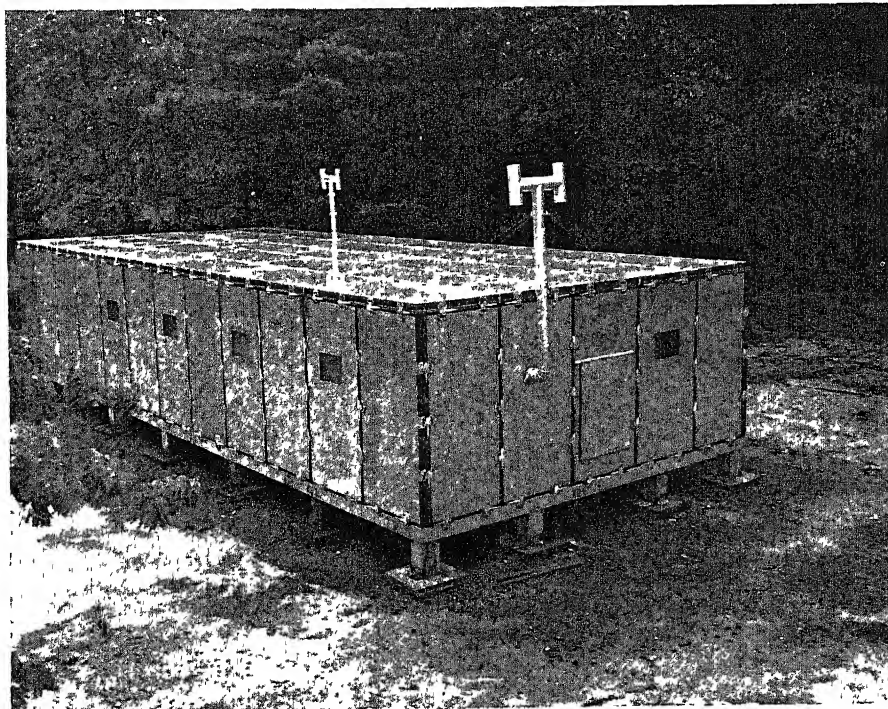
It is a box-shaped structure with flat roof that can be erected quickly in the field. It is 20 feet wide and eight feet high, and can be any multiple of eight feet in length that may be desired. The unit now under tests is 48 feet long.

The prefabricated parts are restricted to approximately 100 pounds in weight for easy handling. The structure utilizes channel aluminum floor beams, and panels for walls, roof and floor made of honeycomb construction. The panels are an aluminum alloy. The inner and outer sheets of the alloy are separated by a craft paper impregnated with a resin and shaped to resemble the familiar honeycomb. This type of panel has both strength and resistance to heat passage.

Panels are held together by simple wedge-type connector pins. No special skill is required for erection; the job can be done by ordinary soldiers. Each unit has its own heating and sanitation facilities. The furnaces are oil-fired and blast-driven. They provide a hot-air heating system. An indoor temperature of 70 degrees Fahrenheit can be maintained even when the outside temperature is 65 degrees below zero.

This building is another example of activities of all branches of the Armed Services in developing suitable structures for servicemen for use in various parts of the world and under various conditions. Ease of erection in forward areas is an essential. The particular weather to be encountered is the number one consideration.

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BUT IT'S SO WARM INSIDE—The aluminum prefabricated hut which can be erected quickly in the field provides complete protection for GIs in sub-zero weather.

MEDICINE

Year's Worst Polio Outbreak May Help Solve Mysteries

► THE little southern town of Wytheville, Va. which has been the scene of the nation's worst polio outbreak this year may help solve some of the mysteries surrounding this feared disease.

No one knows how polio is carried from victim to victim. The unusual prevalence of this disease, 50 times the usual epidemic rate, may give scientists a chance to discover just how it is spread, whether by insects or water or directly from person to person.

Dr. Alexander Steigman, University of Louisville, Ky., professor and consultant to the National Foundation for Infantile Paralysis, has been supervising the collection of insects, blood, water and human wastes in which may be found one of the viruses of infantile paralysis.

The virulence of the disease in Wytheville and the large number of cases may mean that a new type of virus, a fourth sort additional to the now-recognized three types, has attacked this small southern community. Or it may mean merely that the virus causing this outbreak is one to which Wytheville residents have not previously been exposed.

Getting sick with one kind of polio virus does not give protection against infection with another of the polio viruses. That is why people sometimes have a second attack of the disease, and theoretically three attacks are possible.

But it will take weeks of research to discover whether the Wytheville epidemic is going to help solve some of the polio mysteries.

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PSYCHIATRY

No Key for Sister May Mean Marital Troubles

► GIVING the young son his own doorway while requiring his sister to report in early may be paving the way for later marital unhappiness.

This is the suggestion of Dr. Mirra Komarovsky, of Barnard College, Columbia University, based on study of the biographies of 73 girl college students.

The girls who had brothers reported that the boys in the family were given earlier as well as more frequent chances at independence than were the girls.

In the middle class American home, if these families are typical, the boy is permitted to take his first train ride alone at an earlier age. He goes to baseball games or movies unaccompanied younger. He sets off for school alone at an earlier age. He has greater privacy over his phone calls and letters. And he is permitted to go out in the evening without explaining his absence. His sister, on the other hand, must

give a strict account, if not required to get permission for absences from home.

This difference in the home training of boys, and girls may make it more difficult for the girl after marriage to be independent of her parents, to make her own decisions, or to face the disapproval of her mother in case of any conflict between her and the girl's husband.

It may be why, when the sea of matrimony gets rough, the wife is inclined to "go home to mother."

Dr. Komarovsky urges further research to find out whether the attachment to parents is greater among women involved in family disputes and divorces.

Details of the study are reported in the *AMERICAN SOCIOLOGICAL REVIEW* (August)

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CHEMISTRY

Atomic Glasses Protect Eyes from X-Rays, Neutrons

► NEW glasses that prevent atomic eye damage have been achieved. For protection against X-ray and neutron radiation from atom smashers, atomic reactors and even atomic bombs, the new transparent materials were developed through research directed by Dr. Alexander Silverman, head of the University of Pittsburgh's department of chemistry.

The world's first neutron-absorbing glass contains cadmium borosilicates with fluorides. Transparent protection for the eyes against slow neutrons given by this new glass is equal to a layer of opaque cadmium a third as thick. Goggles of this glass are expected to guard against cataracts caused by accidental exposure to neutron beams which have affected several scientists in past years.

Another new glass has X-ray-absorbing power 50% greater than the best commercial X-ray shielding glass. Tungsten phosphate produces this effect and the new glass does not discolor on exposure to the high energy X-rays or gamma rays.

People generally might wear such glasses if atomic bomb attack is expected, but they would be especially useful for research workers around cyclotrons, betatrons and other atom smashers.

Dr. Silverman also expects both glasses to be used in thick laminated portholes in the safety barriers in atomic energy plants. Instruments involving gamma and neutron radiations will also use them.

Goggles can be made with composite lenses to protect against both kinds of radiation or single lenses for one kind only.

Associated with Dr. Silverman in the development of the X-ray-absorbing glass were Dr. Joseph J. Rothermel and Dr. Kuan Han Sun. The research team developing the neutron-absorbing glass consisted of Dr. Silverman, Dr. Sun, Laben Melnick and Dr. Hurd W. Safford.

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MEDICINE

Male Hormone Relieves Pain of Menstrual Periods

► SUCCESS with a method of using male sex hormone to relieve severe monthly pain in women is reported by Dr. William Filler of Jackson Heights, N.Y., and New York University College of Medicine and Bellevue Hospital, in the *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* (Aug. 5).

Small doses of the hormone chemical, methyltestosterone, were given by mouth three times a day for six days before ovulation. Part of the success of the treatment, Dr. Filler and associates believe, is due to giving the hormone at this time in the monthly cycle, when the egg is discharged from the ovary. This is about half way between the menstrual periods.

The dose given is well below that which might produce masculinization, such as growth of beard.

Almost three-fourths of the patients, 16 out of 22, got complete relief of pain from this treatment. The other six experienced partial relief. The doctors do not now feel concerned as they did originally about the possibility of interfering with the woman's having babies. Three of the patients became pregnant immediately after stopping the treatment, and there is no evidence that the treatment suppresses discharge of the egg from the ovary.

The treatment is for those women whose pain is not due to any organic disorder nor to psychologic conditions, which cannot be relieved by similar measures, and who are incapacitated each month by the pain.

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VETERINARY MEDICINE

Golden Drug Helps Turkeys' Sinus Trouble

► SINUS trouble in turkeys, an ailment different from that in humans, is the latest bane to fall before the golden-yellow antibiotic aureomycin.

Dr. J. E. Prier of the College of Veterinary Medicine at the University of Illinois reports in the *JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION* (August) that aureomycin inhibits the agent of infectious sinusitis in turkeys. The agent is believed to be either a virus or another type of germ known as rickettsiae.

Sinus infection in turkey flocks, although not normally fatal, slows the birds' rate of growth and often makes them unfit for market on time.

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MEDICINE

Sex Hormone Treats Diabetic Children

➤ GOOD results with sex hormone treatment of children with diabetes were reported by Drs. R. Ramos and C. de Nogales of Barcelona, Spain, at the sixth International Congress of Pediatrics in Zurich, Switzerland.

The children, the Spanish doctors reported, needed less insulin when given sex hormones. They recovered from dehydration, acidosis and signs of faulty fat utilization. Their handling of starches and sugar became more stable.

Object of the sex hormone treatment is to suppress the part of the pituitary gland which produces a hormone formerly called diabetogenic, or diabetes-producing. This hormone is now recognized as ACTH, the anti-arthritis hormone. Production of diabetes is one effect doctors have had to guard against in using this hormone for treating arthritis or other conditions. Although the Spanish doctors are enthusiastic over the results of sex hormone treatment of diabetic children, other doctors want to see the results confirmed by work elsewhere.

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DENTISTRY

Radioactive Chemical Aids Tooth Decay Fight

➤ A RADIOACTIVE chemical is now helping in the fight against tooth decay. Studies with it at the Los Alamos Scientific Laboratory in New Mexico may show whether or not decay can be checked or prevented by substances put on the teeth, such as ammoniated tooth powders and pastes and mouth washes.

The enamel of teeth, the studies show, soaked up the radioactive chemical something like a sponge. This shows that chemicals for checking tooth decay could penetrate the enamel. Other chemicals that may enhance tooth decay also could penetrate the enamel.

The radioactive chemical used in these studies was urea made with radioactive carbon 14. Results are reported by Drs. William Ward Wainwright and Frank A. Lemoine in the JOURNAL OF THE AMERICAN DENTAL ASSOCIATION (August). Urea was used, the scientists explained, because of its potential properties for reducing tooth decay and because of the small size of its molecules. This last makes for greater penetrating power.

The radioactive urea, in water, was spread over the crown surface of 14 human teeth

10 minutes after they were extracted. The degree of penetration was indicated by highly sensitive radioautographs able to record extremely small quantities of the radioactive substance on a special X-ray film.

The scientists found that penetration of the enamel took place rapidly, possibly within 10 minutes. In some of the teeth, the radioactive material, after spreading through the enamel, diffused through the underlying calcified dentin and then entered the pulp of the tooth.

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PLANT PATHOLOGY

Diseased Leaves Absorb Radioactive Sulfur

➤ THE first experimental demonstration that leaves infected with rust and mildew actually absorb the sulfur that combats the infection has been made with the use of radioactive sulfur, by-product of the atomic bomb.

Farmers and gardeners have used sulfur in various forms to fight fungus diseases, but no one has heretofore determined quantitatively that more of the chemical was concentrated in the rusted and mildewed areas of the leaves.

Drs. C. E. Yarwood and Louis Jacobson of the University of California's divisions of plant pathology and plant nutrition exposed diseased plants to radioactive sulfur 35 obtained from the Atomic Energy Commission. This treatment was lethal to rust or powdery mildew on bean and sunflower leaves but did not harm the plant.

Then the treated leaves were put next to an X-ray film for two days and the radioactive sulfur concentrated in the fungus colonies showed up as exposed areas on this radioautograph film.

This selective absorption by the diseased tissues, the California scientists believe, will explain other cases of chemotherapy in plants and animals without assuming that the disease and the host have a different sensitivity to the curing substance.

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PLANT PATHOLOGY

Leafhopper Culprit Carries Fruit Virus

➤ A GREENISH-YELLOW leafhopper, about one-fifth of an inch long, has been tracked down as the culprit carrying a fruit tree virus known as western X disease.

Entomologists of the Department of Agriculture, working with the Washington and Oregon agricultural experiment stations, made the discovery. They identified the insect as one *Colladonus geminatus*.

Western X disease injures peaches up and down the west coast, particularly in sections of Utah and Washington. It also hits cherry trees. Until now, no one knew how the disease was transmitted.

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DENTISTRY

Ammoniated Dentifrices May Give Gum Trouble

➤ A HINT that ammoniated tooth powders and pastes, widely promoted as anti-tooth decay agents, may add to the dental troubles of older persons by causing gum inflammation appears in a report to the JOURNAL OF THE AMERICAN DENTAL ASSOCIATION (August) in Chicago.

The report is from Dr. Maynard K. Hine, dean of Indiana University School of Dentistry at Indianapolis.

One of the well known theories of the cause of tartar is that ammonia is set free in the mouth and that this alkalizes the saliva, allowing calcium to precipitate from it, Dr. Hine points out.

Tartar, or calculus as dentists term it, is not merely an unsightly thing. When it gets under the gums, these hard deposits may cause serious inflammation.

Studies of the use of ammoniated dentifrices have so far not shown an increase in these deposits. But the best and most careful studies, Dr. Hine states, have been made on children who usually show very little tendency to have these deposits.

"The effect of ammonia-producing dentifrices must be carefully watched," he warns.

It would not be "desirable" to reduce tooth decay at the expense of an increase in calculus in older patients where tooth decay is less common than inflammation and disease of the gums.

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AERONAUTICS

Tunnel to Tackle Plane Boundary Layer Problem

➤ ONE of the toughest problems in aviation, that of the so-called boundary layer of air next to the plane's fuselage and wings, is to be studied in a new low-speed wind tunnel now being completed at Cornell University.

More specifically, it is to study the rough air called the turbulent boundary layer which causes drag on the plane and decreases speed. The boundary layer is a thin layer of air between the surface of the plane and the outer volume of air through which the plane is passing. It is apt to "break" toward the trailing edge of the wing, creating the turbulence.

This low-speed wind tunnel will have a rough air layer created by a 125-horsepower motor that will produce air velocities of about 75 miles an hour. The air passage is six feet in diameter, and the entire doughnut-shaped steel structure is some 85 feet long and 20 feet wide.

The problem will require five years to solve, it is expected. It will be under the supervision of Prof. William R. Sears.

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PSYCHIATRY

Therapy for World's Terrors

Children bewildered by their present day complex environment receive reassurance coupled with love in the University of Chicago school.

By MARJORIE VAN DE WATER

➤ TELEVISION and radio scare stories, crowded apartment life and a succession of new gadgets which put mortal danger within the reach of baby fingers make it more and more difficult to be a good parent.

"Love is not enough," says Dr. Bruno Bettelheim, Vienna-born psychiatrist. It must be supplemented by deliberate efforts on the part of the parent to raise children successfully in our present-day complex environment.

The tired parent finds it much harder to put breakable or dangerous things out of the child's reach than to say "No!" or to slap his hands. The result is that frequent and often angry "nos" convince the child this is a world full of incomprehensible dangers where the only safe thing to do is to do nothing, and that to try to find out things for oneself is something bad.

Parents can get many good ideas on how to make the environment of their own home more favorable for mental health in their children from the experience of a special school where emotionally disturbed and mentally ill children are being brought back to health.

In the attempt to bring these sick children back to normal, much is being learned about the situations which have made these little boys and girls feel that life is just too difficult or unhappy to be endured. The school, which is called the University of Chicago Sonia Shankman Orthogenic School, is under the direction of Dr. Bettelheim.

What is done for children in the school and much of what has been learned from the children is reported in a new book by Dr. Bettelheim, "Love Is Not Enough," (The Free Press).

Psychiatric treatment is given to the mentally sick children at the school, but not just in the detached situation of the treatment room. Their problems are handled as they arise in the same situations that produced them.

Bathroom a Battleground

One such charged situation is in the bathroom. The American family bath is apparently a battleground between mothers and children in which the child is often the eventual loser.

Children arrive at the school often the victim either of a compulsive need to be clean so that they are driven into a panic

by the thought of getting so much as a speck on a dainty little white dress, or else a hostility produced by painful scrubblings that makes them ready to scream at the thought of washing behind the ears.

No child is forced to wash at the school. They learn first to enjoy sitting in the tub in pleasantly warm water playing with toys. Gradually the idea of washing is introduced as the child is ready not to be disturbed by it.

"What happens around here if you don't brush your teeth?" one child asked seriously, evidently expecting that some disaster or drastic punishment would result. He was told that no one would be much concerned about it but that his teeth might get dirty.

The boy thought that one over and then said, "That's right, they might."

Waking Made Pleasant

Waking up in the morning is a very important moment, it was found at the school. These children have passed a restless night filled with nightmares and terrors. They are not eager to begin a day charged with fears and possible disaster.

So there are no clanging bells to start

the day here, a child is usually awakened by having a candy or a cookie popped into his mouth or placed in his hand. This is a reassurance that the day can bring pleasures as well as disagreeable events and struggles.

Then the children are gently lured into joining in play, at first with little toys placed right on the bed, later with the other children on the floor. Gradually they are fully awake and ready to dress.

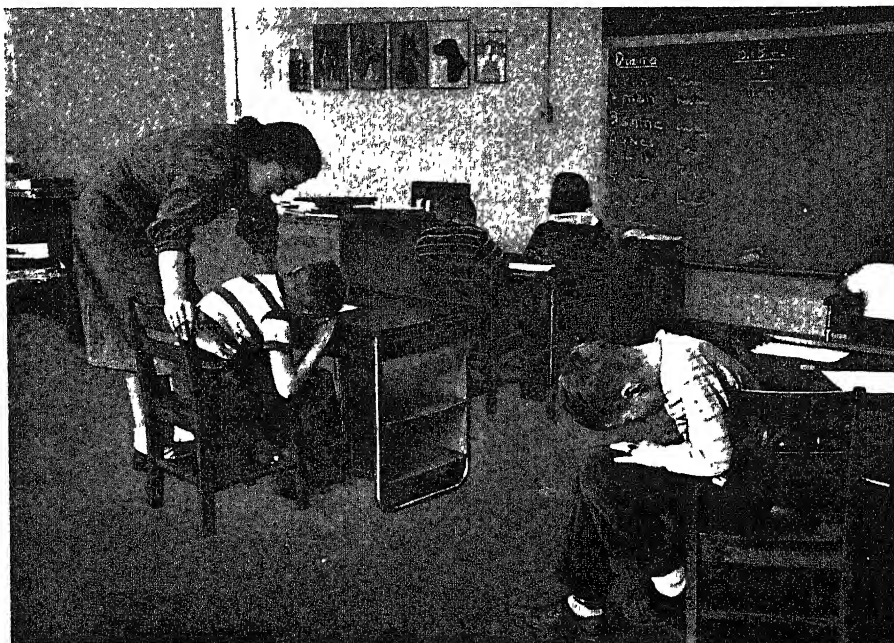
Food as a Symbol

The dining table is another "charged" situation. To some children, food is more than just nourishment but a symbol of all pleasures and security.

In addition to three main meals, there are two regular snacks—one at about three o'clock, the other at bedtime. And then there is an endless supply of cookies and candies. Every child is made to feel that he is entitled to bread and butter and milk whenever he wants it, and all he wants, day or night.

Some children want to eat unbelievable amounts of food and hoard secret stores for "emergencies." For others eating is such a misery that they have to learn how to enjoy food.

These children are given whatever they want whenever they want it. If they don't enjoy drinking milk from a glass, they may suck it through a straw or even, in



DESPAIR NOT TABOO—Two boys give up in despair during a class at this unusual school at the University of Chicago. They do not have to pretend to be attentive but can openly show how they feel. The teacher does not chide, but tries always to give the children understanding.



DEFENSE FOR NOCTURNAL TERRORS—Terrors of night haunt all anxious children. They feel better if they have their prized possessions at hand. The boy's animals will keep watch for him during the night.

some cases, take it from a nursing bottle.

Bedtime is one of the most important parts of the day. When it is possible to restore the ability to enjoy ten or more hours of unbroken sleep a long step has been taken toward calming the children's nervous strain, making them less anxious and less tense. For most of the children enter the school with a long history of insomnia and night terrors.

A bedtime snack helps to quiet the children down for the night. Then comes a story, during which some of the children drop off to sleep. But later there is a ritual which must be gone through by many of the youngsters. Some must arrange their clothing, some must count their animals, some must be tucked in in a special way. Nearly all have a special toy with which they must sleep, even the bigger boys and girls. No one laughs at them for it.

Learning Ability Necessary

The treatment of a child is not considered completed until he can learn. He must be able, not only to succeed in the classroom, but to really want to learn on his own and to enjoy the classroom.

Most children enter the school with an active aversion to learning. This may be because of a fear of acquiring knowledge or a fear of competition and of being with other children. At the school, lessons are limited to not more than three and one-half hours in the classroom. There is no homework, no letter-writing or other outside assignments.

On the other hand much of the class time is spent in painting or drawing, in taking care of animals in the schoolrooms, and

playing games when an assignment is finished. Every attempt is made to make learning pleasant and a satisfying experience to the child. He is permitted a good deal of choice in what he will learn, what books he will read.

Once the barriers against learning are overcome, the teachers at the school do not need to worry about the children. On the contrary, they have to be careful that they do not make too rapid progress and leave children of their age behind.

With small classes, individual attention and learning geared to the child's inclinations and abilities, most children easily make two or more years' academic progress in a single year's time.

Science News Letter, August 12, 1950

AGRICULTURE

South's Land Will Rival Midwest's Loam

➤ THE Deep South, land of cotton and tobacco, will some day be a competitor of the black loam belt of the Midwest in growing corn, hogs and cattle, a Department of Agriculture official predicted in Raleigh, N.C.

New knowledge of pasture crops and soils has brought profitable livestock enterprises to many areas of the South, Dr. Robert M. Salter, chief of the Bureau of Plant Industry, Soils and Agricultural Engineering, said at North Carolina College of Agriculture's annual fair and home week.

Boosts in the amount of feed crops able to be grown on Southern soils through scientific management, Dr. Salter reported, make feasible a livestock industry in the South three times its present size. This would mean the conversion to forage crops—clovers, grasses and legumes—of millions of acres of non-productive land, he said.

Science News Letter, August 12, 1950

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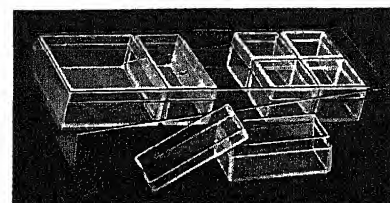
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CHEMISTRY

Rubber Reconversion Easy

➤ IF all-out mobilization comes, the United States will be on a much bouncier footing than it was 10 years ago. The nation will switch with hardly a pause from trees in Malaya to refineries in Texas for one vital war need—rubber.

Tires from chemicals were the magic made real in the '40's.

When the Japs overran the Malayan Peninsula, Singapore and the Dutch East Indies in the first weeks after Pearl Harbor, a genuine rubber scare resulted in the United States. Then the wheels of peace and war depended almost completely on natural rubber.

There was a rash of proposals and cure-all ideas. A decade earlier, Thomas Edison had made headlines with his method for obtaining rubber from giant goldenrod.

The guayule plant similarly would give rubber, up to 20% of its own weight. By March of 1942 the government began planting thousands of seedlings of this scrawny, shriveled-up bush. By 1946 it hoped to have a respectable return of rubber from its guayule plantations.

But the country could not wait for guayule, or goldenrod, or rabbit brush, or the Russian dandelion called "kok-saghyz" which kept the Red war machine rolling. Desperately the U.S. began building synthetic rubber plants, utilizing the chemists' knowledge of how to make passable rubber from oil and coal.

Butadiene and styrene were the principal ingredients. Butadiene from petroleum or alcohol, styrene from coal. From these, big molecules could be built of little molecules, and the result was rubber.

In 1941 the U.S. had previously made only some 8,000 tons of synthetic rubber. By 1945, a million tons a year could be turned out by the mixing plants. It was called GR-S—Government Rubber-Styrene. It was known also as Buna-S.

Other synthetics were developed for special jobs. Buna N for bullet-proof gas tanks, neoprene, thiolol and butyl. By the end

of the war, these were nearly as good for countless jobs as natural rubber.

Then, in 1946 and 1947, came cold rubber. It was made of the same materials as Buna-S. Mixed at 41 degrees Fahrenheit with new bonding agents, however, it had greater toughness and resiliency. It made the U.S. forever independent of the Hevea tree, source of natural latex in lands far away. Cold rubber tires are better.

By the end of last year, 150,000 tons of cold rubber alone could be made annually by government-operated plants. In June, three more synthetic plants from World War II were put back into operation. Their addition gave the U.S. 18 such plants in use, with nine others in standby.

If once again the rubber plantations of Asia are cut off, Uncle Sam will be able to turn quickly to the chemists' magic of making rubber tires by mixing liquids in giant tanks.

Science News Letter, August 12, 1950

MEDICINE

Sliced-Off Finger Stuck Back, Changes Fingerprints

➤ PART of a finger sliced off and stuck back on 37 years ago has now healed up so that the finger is normal. But the fingerprint still shows the evidence of the healing of the graft.

This new evidence of how hard it is for criminals to fake their fingerprints was reported in the scientific journal NATURE (July 15) by Dr. Cyril John Polson of the department of forensic medicine, School of Medicine, in Leeds, Eng.

The finger slicing occurred not to a criminal, however, but to a young woman whose identity is hidden behind the initials, "A D S". A. D. S. also did the grafting and is quite proud of her work, especially since her physician at the time did not believe it would heal.

She lost the slice off her finger in a fruit slicing machine, quickly recovered the piece from the blade of the machine and replaced it on her finger. She had the presence of mind to "match the finger grain" on her finger. Then she bound the piece in place with a bandage wet with Friar's Balsam, a household remedy of a generation ago. For some weeks she left the bandage in place and kept it moist with the tincture.

Although a fingerprint taken recently shows that she succeeded in matching perfectly the pattern of her fingerprint, a faint mark reveals where the graft healed. Dr. Polson reports that "it is unlikely that even skilled surgery would leave less trace than this."

Only previous record of a successful graft

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of the skin of a finger, according to Dr. Polson, was reported more than 50 years ago by Sir Francis Galton. This case also was one of self-surgery. But Galton's subject, a young man, in his haste to slap the slice from his thumb back in place, put it back at right angles to its original position. His finger ridges were therefore shifted around in subsequent fingerprints.

Science News Letter, August 12, 1950

METEOROLOGY

From Inside or Out, New Atlas Describes Clouds

➤ WHAT a cloud looks like from an airplane—from above, from inside and from just below—will become a much more important part of weather forecasters' data when the new International Cloud Atlas is completed in 1952. It will contain an extensive section describing different types of clouds as they look to observers in planes.

The expansion of a very small section on plane observations in the last atlas, published in 1932, was approved at a recent meeting in Paris of the Committee for Study of Clouds and Hydrometeors of the International Meteorological Organization, Dr Charles F. Brooks, director of the Blue Hill Observatory and American representative on the committee, told Science Service.

The International Cloud Atlas is one of the most important tools of the weather forecasting trade. It enables observers all over the world to agree on specific descriptions of clouds and it enables forecasters to know exactly what kinds of clouds the observers are reporting.

Observation of clouds from planes is becoming much more common throughout the world because it is much easier to determine the true altitude, the shape and the extent of the cloud from a plane than it is from the ground. Also the airborne observer can give the forecaster some idea as to whether the cloud is composed of liquid or ice particles.

Second major improvement, which was just about completed at the Paris meeting, was in the definitions of the 10 types into which meteorologists have divided clouds. The 13 members of the committee tightened up the definitions and described distinct limits between different types of clouds. Photographs to illustrate what they meant by their definitions were selected.

Science News Letter, August 12, 1950

AGRICULTURE

Preserve Fresh Grape Flavor for Concentrates

➤ A WAY of preserving the volatile flavor essences of grape juice has been developed by U. S. Department of Agriculture scientists. The extracts are said to give a new

grape juice concentrate the characteristic taste of freshly-squeezed grapes.

Grape juice thus promises to join the booming field of canned fruit-juice concentrates, most successful of which has been frozen concentrated orange juice. The new process for treating Concord grapes was devised at the government's Eastern Regional Research Laboratory in Philadelphia.

Science News Letter, August 12, 1950

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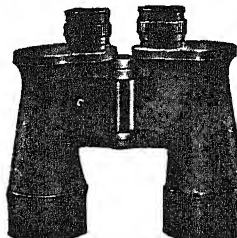
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Swans

➤ ACCORDING to ancient custom in England the swan has the status of a royal bird, and swan-keeping is a royal prerogative. Under certain conditions the Crown will grant the privilege of keeping swans, together with a "swan mark," a mark similar to a cattle brand which is cut into the bird's upper bill for identification.

The swans seen on the Thames bear the swan mark of the king and of two guilds, the Dyers Company and the Vintners' Company. Once a year all Thames swans are collected in a ceremony known as "Swan-Upping," and the young cygnets are marked and their flight feathers are cut.

This royal bird, the mute swan, is a native of Europe and Asia. It was introduced into North America as a domesticated bird to adorn parks and estates in the European manner. In the course of time individuals have escaped from domestication, and by now the mute swan has become established to some extent in the East, notably in the Hudson Valley.

Despite its name, the mute swan is capable of making sounds. It can sound a re-

sounding trumpet call and when aroused it hisses angrily.

The two native American swans are the trumpeter swan and the whistling swan. The trumpeter, largest of all swans, reaches a length of more than five feet, measured from bill to tail with the neck stretched straight as in flight. It is the most publicized of the swans in this country because of the heroic fight being made to save it from extinction.

Although trumpeters once existed in great numbers here, the steady development of the land has slowly driven it towards the vanishing point. Small numbers of wild trumpeters in Canada and a few hundred which seem to be thriving on government wildlife refuges in the West represent the last slim hope that this magnificent bird will survive.

MEDICINE

Tension in Blood Pressure

➤ EMOTIONAL tensions are an important factor in the development of high blood pressure, many research physicians believe. Evidence for this view is piling up.

A group of University of California School of Medicine researchers have reported the following findings in a paper in the AMERICAN JOURNAL OF MEDICINE.

1 Of a sampling of patients with high blood pressure, 75% had unique personality patterns which differed distinctly from those of well persons and patients with other illnesses.

2 Dizziness, headache, fatigue and other symptoms often believed to result from high blood pressure usually preceded by many years the discovery of the existence of the disease.

These findings pose the possibility that the high blood pressure developed as a result of long-standing emotional conflicts which probably were responsible for the symptoms.

For whatever consolation it may be if the trumpeter becomes extinct, its call has been recorded for posterity. In 1937 Dr. A. A. Allen captured two cygnets and then made a transcription of the ensuing rescue by the two parents, complete with cries of distress from the youngsters, the reassuring honks of the parents and then finally the swanly hubbub of happy reunion.

The whistling swan is about ten inches shorter than the trumpeter, and gets its name from the shrill sound, not really a whistle, uttered by the migrating flock. The whistler breeds in the far Arctic north. This fact plus its habit of extremely high flight and a strong innate wariness seems to account for the whistlers' marked success in surviving on this continent which man has rendered so inhospitable for so many other creatures.

Science News Letter, August 12, 1950



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AERONAUTICS

How Slow Can a Plane Be?

➤ WIND tunnel with a reverse twist: How slow, not how fast, will an airplane fly?

To find out just how slow, light liaison aircraft are being tested in a specially designed wind tunnel at the University of Wichita in Kansas.

This slow-speed flight research indicates that planes may be able to fly as slow as 20 miles an hour. At that air speed a plane headed into a 20-mile-an-hour wind could hover like the present-day helicopter.

Under the direction of Prof. Kenneth Razak, head of the school of engineering, the study is being made primarily for the United States Navy for application to carrier-

type planes, including jets. The information obtained will, however, apply to other aircraft.

Flight speed is decreased by putting slots in both the leading and trailing edge of the airplane's wings. The flow of air through these slots and over the flaps reduces the speed of the aircraft. The same lift and increased control are maintained with the use of slots.

Present day carrier-type aircraft with a landing speed of approximately 80 miles per hour could be landed on the deck of a carrier at 60 miles per hour if wing slots were used, Prof. Razak believes.

Science News Letter, August 12, 1950

Books of the Week

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AMPHIBIANS OF WESTERN CHINA—Ch'eng-Chiao Liu—*Chicago Natural History Museum*, 400 p., illus., \$7.50. A monograph defining and describing the species of salamanders and frogs which the author found in the Chinese region bordering on Tibet. Many valuable illustrations including several color plates.

BOTANY FOR GARDENERS—R. P. Faulkner—*Scribner*, 236 p., illus., \$3.50. A background of general knowledge with emphasis placed on plant physiology and its practical application. Written for the amateur by a British author.

BRITAIN 1949-50 A Reference Handbook—*Central Office Of Information, London*, 204 p., paper, free upon request to the British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. Data on aspects of British life such as communications, industries and social services.

CALCULATING INSTRUMENTS AND MACHINES—Douglas R. Hartree—*University of Illinois Press*, 138 p., illus., \$4.50. A summary of progress in the development and use of high-speed computing devices. Intended for the users of such instruments as mathematicians, physicists and engineers.

COMMERCIAL FEEDING STUFFS Report on Inspection 1949—H. J. Fisher—*Connecticut Agricultural Experiment Station*, Bull. 539, 136 p., illus., paper, free upon request to publisher, New Haven, Conn. An inspection of commercial feeding stuffs in Connecticut as to their ingredients.

DAIRY SCIENCE Its Principles and Practice—W. E. Petersen—*Lippincott*, 2nd ed., 695 p., illus., \$5.00. Designed primarily as a college text for students of dairy production.

THE EARLY CULTURES OF NORTH-WEST EUROPE—H. M. Chadwick Memorial Studies—Sir Cyril Fox and Bruce Dickinson, Eds.—*Cambridge University Press*, 441 p., illus., \$11.50. Twenty-two essays written by pupils of Professor Chadwick in his honor.

EIGHTH SEMI-ANNUAL REPORT OF THE ATOMIC ENERGY COMMISSION, JULY 1950—*Gov't. Printing Office*, 230 p., paper, 55 cents. Control of radiation hazards is exhaustively reported in the first portion of this book. It is in effect a handbook upon this subject. See SNL, Aug 5, p. 83.

FIELDS OF PSYCHOLOGY Basic and Applied—J. P. Guilford, Ed.—*Van Nostrand*, 2nd ed., 779 p., illus., \$5.00. Outstanding authorities present brief introductions to their respective fields. This edition has been revised to include some of the latest advances.

A FRAMEWORK FOR LONG-RANGE AGRICULTURAL POLICY—Oscar Helene and Donald R. Kaldor—*National Planning Association*, Planning Pamph. No. 72, 68 p., paper, 50 cents. Presents the authors' views on long-term peace-time agricultural goals and ways to achieve them.

A GERMAN AND ENGLISH GLOSSARY OF GEOGRAPHICAL TERMS—Eric Fischer and Francis E. Elliott—*American Geographical Society*, 111 p., \$3.00. Compiled to aid the American geographer to read German literature.

IDEAS & MEN The Story of Western Thought—Crane Brinton—*Prentice-Hall*, 587 p., \$6.00. A brief history of western culture.

INTERIOR DESIGN—J. R. Shipley—*Small Homes Council, University of Illinois*, Circ. Series Index No. H1 O, rev. ed., 8 p., illus., paper, 10 cents. Suggestions for making a low-cost house as livable as a large home.

LIST OF Sires PROVED IN DAIRY-HERD-IMPROVEMENT ASSOCIATIONS, 1950—Division of Dairy Herd Improvement Investigations, Dept. of Agriculture—*Gov't. Printing Office*, 279 p., paper, 60 cents. The names and summarized "proved-sire" records of 4,356 sires whose records were tabulated by the Bureau of Dairy Industry between Jan. 1, 1949 and Jan. 1, 1950.

MAYA HIEROGLYPHIC WRITING Introduction—J. Eric S. Thompson—*Carnegie Institution of Washington*, Publ. No. 589, 347 p., illus., paper \$7.00, (cloth \$7.50). Report of research on the geographical and cultural setting for the Maya hieroglyphic writing. Many valuable illustrations.

MENTAL TESTS IN CLINICS FOR CHILDREN—Grace H. Kent—*Van Nostrand*, 180 p., \$2.45. The author emphasizes that tests should be adapted to the child; with his interests, his handicaps, and his attitude toward the testing situation taken into account. Primarily an auxiliary textbook for advanced students in clinical psychology.

METALS AND ALLOYS—Technical Staff of "Metal Industry"—*Chemical Publishing Co.*, 214 p., \$5.00. A reference book listing in tabulated form the composition of some 4,600 alloys. Useful to metallurgists, engineers, chemists and buyers and salesmen of metals.

MINIONS OF THE MOON A Novel of the Future—William Gray Beyer—*Gnome Press*, 190 p., \$2.50. A science fiction novel concerning the rebirth of civilization thousands of years in the future.

MODERN GLASS WORKING AND LABORATORY TECHNIQUE—M. C. Nokes—*Chemical Publishing Co.*, 157 p., illus., \$3.75. Instructions are given for the working of new glasses such as Pyrex. Of British origin.

NUTRITION In Health and Disease—Lenna F. Cooper and others—*Lippincott*, 11th ed., 744 p., illus., \$4.00. A basic text brought up-to-date.

ORGANIC CHEMISTRY—Louis F. Fieser and Mary Fieser—*Heath*, 2nd ed., 1125 p., illus., \$7.50. A standard organic chemistry text brought up-to-date.

PHARMACEUTICAL EMULSIONS AND EMULSIFYING AGENTS—Lawrence M. Spalton—*Chemical Publishing Co.*, 132 p., illus., \$3.75. Presents the practical details relating to the large number of emulsifying agents now available for use in pharmacy. Primarily for the practicing pharmacist and student of pharmacy. Of British origin.

THE PHILOSOPHY OF MATHEMATICS—Edward A. Maziarz—*Philosophical Library*, 286 p., \$4.00. A brief history of the origin and nature of mathematical reasoning and the author's

theory on how to integrate this information in the total pattern of scientific and philosophical thinking.

PRACTICAL GYNECOLOGY—Walter J. Reich and Mitchell J. Nechtow—*Lippincott*, 449 p., illus., \$10.00. A guide to the techniques of office gynecology, including systematic routines of examination, laboratory tests, biopsy, cytology, diagnosis and management of commonly seen disorders.

PRIMARY BATTERIES—George Wood Vinal—*Wiley*, 336 p., illus., \$5.00. Presents a wealth of information on primary batteries, including a chapter on standards of electromotive force. The author was for 32 years responsible for the maintenance of the standard volt at the National Bureau of Standards.

THE PSYCHOLOGY OF MENTAL HEALTH—Louis P. Thorpe—*Ronald*, 747 p., illus., \$5.00. A college text on mental hygiene.

RADIATION HAZARDS OF RADIOACTIVE ISOTOPIES IN FIRE EMERGENCIES. An Introductory Report, June 1950—*International Association of Fire Chiefs*, 10 p., paper, 25 cents.

SAINTS, SINNERS AND PSYCHIATRY—Camilla M. Anderson—*Lippincott*, 206 p., \$2.95. An attempt to clarify the basic motivations which dominate human activity and to relate overt manifestations of personality to the basic subconscious drive. For those dealing professionally with behavior problems.

A SALESMAN'S HANDBOOK COURSE IN HUMAN ENGINEERING—Guthrie E. Janssen, 48 p., illus., paper, \$1.00. To aid in making salesmanship more effective and mutually profitable for salesman and customer.

SCIENCE AND THE LAND The 70th Annual Report of the New Jersey Agricultural Experiment Station, 1948-49—*Rutgers University Extension Service*, 159 p., illus., paper, 50 cents to non-residents of New Jersey, to residents of New Jersey free upon request to publisher, Rutgers University, New Brunswick, N. J.

SOLUTIONS TO THE PROBLEM OF MERCHANDISE PICKUP AND DELIVERY IN BUSINESS DISTRICTS—U. S. Chamber of Commerce, 24 p., illus., paper, 10 cents.

SUITABILITY OF VARIOUS SOILS FOR TUNG PRODUCTION—Matthew Drosdoff—*Gov't. Printing Office*, 23 p., illus., paper, 10 cents.

A TEXT-BOOK OF INORGANIC CHEMISTRY—J. R. Partington—*Macmillan*, 6th ed., 996 p., illus., \$3.75. A college text brought up-to-date. Of British origin.

Science News Letter, August 12, 1950

ORNITHOLOGY

Discover New Race of Tanagers

➤ ITS legs are white instead of black, and its belly is bright blue. With these clues, the Chicago Natural History Museum announced that it has discovered a new race of tanagers. The bright-hued bird's home is in the arid savanna of Brazil's Goyaz Province. At least the museum thinks it is. The only known specimen was collected 20 years ago. Given a faulty identification, the dead bird has reposed since 1930 in the Chicago Natural History Museum.

Science News Letter, August 12, 1950

• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., Washington 6, D. C. and ask for Gadget Bulletin 529. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

☞ **DRINK COOLER**, which chills the liquid as it is being sipped through the device, is a tube of aluminum, with special mouth-piece, containing a sealed-in refrigerant. Prior to use, the tube is put in the freezing compartment of the refrigerator, and its content allowed to freeze solid.

Science News Letter, August 12, 1950

☞ **ADJUSTABLE STOPPER** for the picnic jug can be made to fit most jugs by a twist of the fingers, making the stopper larger or smaller. Made of aluminum and rubber, it provides an air-tight, leak-proof seal, and it imparts no taste or odor to the jug's contents.

Science News Letter, August 12, 1950

☞ **TROUBLE-FINDER**, for use in the automobile repair shop, resembles the doctor's stethoscope, having similar ear pieces and holder but with an electric probe at the outer end. Grasping the probe by its plastic handle, the point is pried over the seeming trouble area until the clearest sound is heard.

Science News Letter, August 12, 1950

☞ **PLASTIC GUIDE** strips for the typewriter, shown in the picture, separate the finger groups of keys so that the novice at typing learns easily which finger to use for



each key. The strips will fit any standard typewriter, and are easily attached.

Science News Letter, August 12, 1950

☞ **PENCIL** to mark glassware is made of tungsten carbide, replacing the former diamond marker. This metal alloy is cheaper than the diamond but ranks next to it on

the hardness scale. The tungsten carbide pencil comes to a definite point rather than an edge as found in the diamond tip.

Science News Letter, August 12, 1950

☞ **WATER STERILIZER**, for home-to-hotel uses, is an automatic, electrically-operated ultraviolet device which kills disease-carrying contamination by ultraviolet radiation. Purification takes place in a stainless steel tank in the water line. The tank contains four ray tubes.

Science News Letter, August 12, 1950

☞ **PORTABLE LIGHT METER**, designed for measuring street lighting of low intensity but usable indoors, is overnight in size, and is ready for instant use. The detector, containing a light-sensitive cell, is set on the street surface, while the indicator is held in the hand.

Science News Letter, August 12, 1950

☞ **AUTOMATIC CLOSET LIGHT**, easily installed by the home-owner, comes complete in a unit containing lamp, switch, and a flat cord to pass under the closet door to an electric outlet. The switch and light box is fastened by screws in an upper corner of the door frame. When the door is open the light is on.

Science News Letter, August 12, 1950

Do You Know?

Palm trees may become a future source of sugar.

Pig's toe-nails have been ground into powder to make tobacco fertilizer.

One of the most useful forms of carbon is the graphite brush that connects moving and stationary parts of electrical devices.

More actual days of service for a suit or coat will result if the garment is worn for one day, then "rested" the next, according to a textile expert.

Toads and frogs often can be distinguished by their skin; toads are largely land animals with dry and bumpy skin while frogs are generally aquatic and have smooth moist skin.

In the fission atomic bomb, the type already used, the heaviest chemical elements are used, uranium and plutonium; in the fusion process of the proposed hydrogen bomb the lightest element would be used.

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AUGUST 19, 1950

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



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See Page 127

A SCIENCE SERVICE PUBLICATION

\$5.00 A YEAR

VOL. 58, NO. 8, PAGES 113-128

MATHEMATICS-ENGINEERING

From Now On: Computers

Electronic computers, mechanical brains, will push forward man's knowledge in the future. Their use will range from college laboratory to factory.

By WATSON DAVIS

Twenty-first in a series of glances forward in science.

➤ MOST of those who have struggled with arithmetic, algebra, and geometry in school welcome the idea of machines that do mathematics.

Actually mechanical aids to computation are an everyday story so far as simple addition, subtraction, multiplication and division are concerned. Adding machines go back to 1642 and a commercial multiplying machine was built as early as 1820 in France.

"Mechanical brain" development has been a top-priority undertaking since the war. The spur to the urgent interest in high speed automatic digital computing machines has come from their need in research, particularly for devices that would make us strong in case of war.

Take the problem of an attacking supersonic rocket or airplane. Quick as a wink it must be located by radar. Following its superfast path, a computing device must be linked to the complex machines for launching and guiding a countering missile to bring it down. Only a device faster than human figuring could do this. Thousands of other problems cry for similar speedy solutions.

Private industry, as well as the federal government, is investing considerable sums of money in the giant computing machines which largely stem from the famous ENIAC machine completed in 1945. Such devices differ from the ordinary computing machines you see in offices.

They are electronic in their action, for the most part. Tubes and circuits do the arithmetic. Then they must have a memory within themselves that stores up numbers and issues them on demand. A control portion keeps track and manages the whole operation. Then, of course, there must be a way to put information and orders into the machine and get the answers out of it, usually magnetic tape or punched cards.

The machines now building are very fast. They can make an addition in ten-millionths of a second. One trouble is that the best of them have a limited memory, the inner memory of ENIAC being only 20 numbers or orders.

Proud as the scientists are of these man-made "brains" they are quick to admit that in some respects they do not come within a million times of being the equal of the human brain. Our central nervous system has individual nerve cells that turn either on or off.

These are similar to what are called "flip-flop" circuits in the computers, which represent numbers in effect by saying "yes" or "no." The human nervous system has ten thousand million such elements, while the most complicated computer so far built has only about ten thousand.

Built on the principles of present computers, the vacuum tubes of an electronic brain the equal of a human one would take the power of Niagara to light its tubes.

GENERAL SCIENCE

Danger in Mobilization

The following editorial reprinted from the Washington Daily News for Aug. 7 comments upon a Science Service article, "Use of Scientific Ability," that "reports a very real danger" (See SNL, July 29, p 69 for the article.)

➤ THE country's scientific research and applied sciences might be crippled by the present partial mobilization.

In our technological civilization, the importance of this danger can hardly be overemphasized. In fact, the problem probably is broader than the specific scientific areas discussed in the story.

An Army command naturally wants smart soldiers, because smart soldiers kill more of the enemy than dumb soldiers. This is an oversimplification, of course, of the military attitude, but it helps to accent the point; indiscriminate war use of men with comparatively rare talents could so denude a whole generation of its most intelligent members that a nation would seriously lag in the post-war peaceful competition in technological fields.

At present, manpower experts are trying to work out a stopgap program which would prevent blind drafting of specialists in science into the general Army pool.

It is a hard thing to say, and a hard thing to face, but it is certainly a misuse of manpower to send men trained in valuable special skills, men with special intelligence, into situations which could just as well be filled by men not having those qualities. A nation that romantically squanders its most intelligent and valuable members is undoubtedly handicapping itself in a race with a nation that refuses to use up its most intelligent members in such fashion.

Most men do not relish being thought of as hiders behind special technical ability in order to avoid their share of danger.

and Niagara's water flow to cool its tubes.

Always, human brains control the mechanical ones.

For the future, if the expectations of experts are fulfilled, you may find:

A. Giant computers in every college and industrial research laboratory, working on almost all the problems in science's future.

B. Improvements in the memory systems and in the reliability or "accuracy" of the machines, which do make mistakes when they blow a tube, for instance.

C. Use of new devices to replace the electronic tubes, and thus make the computers more reliable and durable. There may be used semi-conductors like the transistor, magnetic devices that do not require power, or electro-chemical elements.

D. Use of computers as a part of complex manufacturing processes that will be operated with a minimum of human labor.

Science News Letter, August 19, 1950

But wars are getting more and more total, civilian populations get bombed as well as armies. Dangers are everywhere, and the onus on a man in a civilian job grows more imaginary than real with each succeeding war. Dangers increase everywhere. Besides, the onus on the individual can be removed by having certain governmental powers to allocate such men to special work, in and out of the services. If a man can best serve his country in a special job for which his intelligence and training especially fit him, his country will gain in the long run by having him stay there.

The problem is pressing, and we hope that some fair and sensible plan can be devised by the National Security Resources Board, the Defense Department and the draft boards, before too much damage is done to the nation's pool of technically qualified men.

Science News Letter, August 19, 1950

INVENTION

Device Picks and Shells Corn

➤ SHELLED corn, not ears of corn, are delivered by an improved harvester that cuts the stalks, husks out the ears and shells them as the machine passes up and down the rows in the field.

It is a two-row tractor-mounted corn picker. The cut stalks pass through it. Snapping action separates ears from stalks to drop into the sheller. The shelled corn passes by conveyor to a truck in the rear.

Inventor is Edward R. Gerber, Stockton, Calif. The patent number is 2,518,302. Rights have passed to the International Harvester Company, Chicago.

Science News Letter, August 19, 1950

NUTRITION

Ice Cream and Bread Laws

Ice cream made with vegetable fat cannot be shipped across state lines for sale. Softeners for bread have been banned, but anti-mold agents may be used.

➤ THE ice cream people all over the land are consuming these hot August days may or may not be made from cream or milk fat. Some of it may be made of vegetable fat

If so, it cannot now legally be shipped across state lines for sale, though it might be just as nourishing and taste just as good.

Orange and raspberry sherbets and fruit ices are in much the same situation. Some are made entirely from fruit juices, some are made partly from fruit juices and partly with citric acid and artificial coloring. These also may be just as refreshing to taste and just as wholesome, but cannot legally be sold in interstate commerce

The reason is that their sale may be a "practice misleading to the consumer." The general provisions of the federal food, drug and cosmetic act call for purity and the use of safe ingredients in food and prohibit practices misleading to the consumer.

Next Nov. 13, when you may be thinking about ice cream for dessert for your Thanksgiving dinner, the Food and Drug Administration will conduct hearings on ice cream and frozen desserts. Object of the hearings will be to find out what health and nutrition authorities and manufacturers think should go into chocolate ice cream, raspberry sherbet and the rest of the frozen desserts. After that, uniform standards and definitions will be drawn.

Ice cream made and sold within a state must conform to state legal standards, but these vary considerably from state to state. Increasing interstate commerce in frozen desserts makes a uniform national standard desirable. Steps toward this were begun with Food and Drug hearings in January, 1942, but standards were not announced because War Food Administration regulations restricted the use of some of the materials used to prepare frozen desserts.

The mixes housewives buy for making their own ice cream and sherbet will not be considered in the coming hearings which are only on desserts sold in frozen form.

Bread, which has been going under a lengthy process of standard setting, is almost at the goal now. A tentative order for standards for various forms of the staff of life has now been issued. Any objections must be filed within 30 days. After that, the final order will be written

Raisin bread may be fruitier, it appears from the tentative order. The standard under this order calls for the weight of the

raisins to be not less than half the weight of the flour

Chemicals designed to make bread seem fresh longer, technically termed softeners or emulsifiers, are banned under the tentative order. Food and Drug officials decided the case for the safety of these ingredients was not sufficiently clear cut. Better a stale loaf than a possibly dangerous one, is the thinking

Certain chemicals used to retard the growth of mold and other micro-organisms which cause spoilage may, however, be put into the bread. These chemicals are sodium and calcium propionates, sodium diacetate, lactic acid and mono calcium phosphate.

Science News Letter, August 19, 1950

MEDICINE

Drug for Stomach Ulcer Checks Excessive Sweating

➤ BANTHINE, new drug being used to treat stomach ulcer, can check excessive sweating of the hands, feet, underarms and other parts of the body. It can therefore be used in place of a not too satisfactory nerve-cutting operation to which patients with pronounced excessive sweating have resorted.

Good results in three such cases are reported by Drs. Keith S. Grimson, C. Keith Lyons, Wm. T. Watkins and K. Lamar Callaway of Duke University School of Medicine, Durham, N. C., in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Aug. 12) in Chicago, Ill.

The drug is taken by mouth in capsules about every four hours. The first patient who tried it learned to regulate the number of capsules according to the activities she had planned for the day.

Science News Letter, August 19, 1950

MEDICINE-PHARMACY

ACTH, Wonder Drug, Made From Cattle's Glands

➤ A WAY to get ACTH, one of the two modern wonder drugs for arthritis, from the pituitary glands of cattle has been developed by scientists at the research laboratories of the Frank W. Horner pharmaceutical manufacturing company in Montreal

A greatly increased supply of the drug should result. Heretofore the only source of it has been pituitary glands of hogs. Extraction from beef pituitaries, though it

should yield more because of the larger size of the glands, was not considered practical.

The process of extracting the hormone from beef pituitaries is more complicated and more expensive. But, says Horner research director Dr. Leonard Mitchell, "we feel that when, as in this case, the cost is not a primary consideration, cattle glands represent a worthwhile source of this important research tool"

Science News Letter, August 19, 1950

ENGINEERING

Plastic Squares for Walls Installed by Amateurs

➤ FAMILIAR tile and fabric coverings for interior walls are now supplemented by a new plastic square which can be easily applied even by the housewife. The product is manufactured in Cresskill, N. J., by the Page Panel Company.

The 12-inch squares have bevelled edges and are tongued and grooved for perfect fit. They are made of high-quality insulating board, permanently covered with Velon plastic sheeting. Held in place by a special cement, the squares are easily cut to fit around window and door frames.

The advantages of a plastic wall, apart from its appearance, is that it is economical, durable and easily cleaned.

Science News Letter, August 19, 1950



WONDERWALL, TWO IN ONE—
The new Velon plastic wall panel not only insulates but decorates. Being applied directly over cinder block walls in the above picture, it can also be installed on wood, plaster, brick or concrete. The tongued and grooved edges make perfect fit and alignment easy.

MILITARY DEFENSE

Troops Before Weapons

➤ WE should slow down the all-out development of weapons of mass destruction like the H-bomb if that is necessary for the provision of enough mobile forces to fight the new "warm" war.

This is the editorial opinion of the BULLETIN OF THE ATOMIC SCIENTISTS (July) as expressed by Eugene Rabinowitch, scientist and editor of the magazine.

Dr. Rabinowitch stated, "One fact has already been demonstrated. It is the utter uselessness of atomic weapons in the present stage of our power contest with the Soviet Union."

The editor called this stage the "warm" war—an intermediate stage between the "cold" and "hot" wars. He said that the atomic weapons would also be useless if the warm war were to extend to other satellite countries, with the Soviet Union remaining "neutral."

"Everywhere, we would be facing the question," he pointed out, "of how to protect a country from subjugation . . . without decimating its people."

"If we concentrate on fabrication of weapons of mass destruction and do not balance this development by the creation of a sufficiently large, well supplied and strategically distributed land force, we will run a double danger," the editor said. He saw those two dangers as "losing out in the peripheral skirmishes with Soviet satellites . . ." and depriving ourselves of "freedom of decision in the event of an open Soviet aggression."

The NEWSLETTER OF THE FEDERATION OF AMERICAN SCIENTISTS (July 19) also came out against using the A-bomb in Korea. An article by Dr. Clifford Grobstein, an officer of the Federation, declared:

"It is the avowed UN intention to localize the conflict in Korea. Good police action is not punitive action; its legitimate objective is coping with the aggressor to restore the status quo ante. This the bomb could never do."

Dr. Grobstein asked the U. S. to lead in organizing major constructive UN action to eliminate the causes of aggression.

Science News Letter, August 19, 1950

PSYCHIATRY

World Peace Can Be Helped by Psychiatry

➤ PSYCHIATRY can help point out the road to world peace. It can do this by providing a "better understanding of emotion as it operates in the human personality, and the way it colors or inhibits our judgment."

This was the opinion voiced in Topeka, Kans., by Drs. William C. and Karl Menninger of the Menninger Foundation. They spoke over the Columbia network as guests of Watson Davis, director of Science Service.

Hate underlies most of the world's problems—in mental illness, prejudice, selfishness and war. Love is the constructive force within us, balancing the destructive power of hate, Dr. William Menninger stated.

"If psychiatry could succeed in its efforts to help us follow the advice of the Great Teacher who 2,000 years ago said, 'Love thy neighbor as thyself,' then it will have made a real contribution to world peace and security," he concluded.

Science News Letter, August 19, 1950

RADIO

Saturday, August 26, 3 15 p.m. EDT

"Adventures in Science" with Watson Davis, director of Science Service over Columbia Broadcasting System.

Mr. Davis will discuss the need of inventions in connection with the present military emergency and the work of the National Inventors Council.

SCIENCE NEWS LETTER

VOL. 58 AUGUST 19, 1950 No. 8

43,500 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W. Washington 6, D. C., North 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50, 2 yrs., \$10.00, 3 yrs., \$14.50, single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago State 4439.

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Question Box

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INVENTION

How can bad breath be detected? p. 120.

MATHEMATICS-ENGINEERING

What is the mechanical short cut to knowledge? p. 114.

MEDICINE

Why may some blood plasma be dangerous instead of helpful? p. 126.

NUTRITION

What kind of ice cream cannot be shipped across state lines? p. 115.

SOCIOLOGY

What is the most peaceful belief possible? p. 117.

Why will there be no marriage boom during this war? p. 121.

Photographs: Cover, Boeing Airplane Company, p. 115, Firestone News; p. 117, U. S. Steel Corporation; p. 119, U. S. Army, p. 122, 123, U. S. Army Air Force.

SOCIOLOGY

Key to Greater Peace

A belief in absolute right and wrong in the world makes it much more difficult to gain international accord. India values harmony rather than rightness.

➤ IF we can make ourselves believe that there is no absolute "right" or "wrong" in the world, we can come much closer to living in peace.

Dr. Byron L. Fox, of Syracuse University and formerly with the cultural relations program of the U. S. Department of State, in an exclusive Science Service interview in Syracuse, N. Y., explained that India comes closest to achieving harmony in spite of sharp differences in religion and race.

In America we have been brought up to place great value on the "right." We are willing to fight for the right, would "rather be right than President." And the person who holds "wrong" beliefs is regarded as a menace. In general, we are unwilling to compromise with the wrong and label any effort in this direction as "appeasement."

In India, by contrast, it is not so important to be "right" as it is to get along with others even when they are "wrong." Harmony is more valued than "rightness."

In order to build a peaceful world, it is necessary for American social scientists to become aware of their own biases which result from the way Americans are brought up to think and feel. We also need to understand the peculiar cultural biases of other people, Dr. Fox says.

The cold war between the United States and the Soviet Union is usually explained in terms of differences in philosophy or ideology based on differences in our cultural traditions.

But America itself is not without its own internal differences. Actually, Dr. Fox points out, America is striving for four different kinds of world—all at the same time. We are working:

Toward a one-world: Through cooperation with the United Nations leading to world government.

Toward a two-world: Through such devices as the Atlantic Pact, the rearming of Europe as an ally and military intervention in Korea.

Toward a three-world: By building up a "third force" in Europe through the Marshall Plan to serve as a buffer between the United States and the Soviet Union.

Toward a no-world: By hanging onto the traditional policy of isolationism and trying to cure world problems through preventive war.

During World War II, scientists discovered the value of "area studies." Instead of studying or teaching the different disciplines without reference to others—economics, anthropology, sociology, history,

language, each in its own classroom—scientists of the different fields collaborated in an over-all study of a single part of the world.

It is time for further cooperation on the part of scientists. Experts in the various areas of the world should get together and compare notes and pool knowledge so as to arrive at an understanding of cultural processes going on in all the various parts of the world and discover a basis for global thinking on world problems.

Dr. Fox is reporting his conclusions in the *AMERICAN SOCIOLOGICAL REVIEW* (Aug.).

Science News Letter, August 19, 1950

ENGINEERING

Water Stretches Steel Tubes to Larger Diameter

➤ WATER is used in McKeesport, Pa., in the new electric weld mill of the National Tube Company to stretch heavy steel tubes

as much as a half inch in diameter.

The tube to be expanded is put within a form to prevent it from swelling beyond the exact outside diameter desired. A fixed plug is fitted in one end and a movable ram in the other. Three pumps force water into the pipe, the thickness of the steel in the pipe walls determining the amount of pressure needed. When the tube has expanded to fit the form, a die it is called, water pressure is lowered and the expanded tube is ready for inspection.

Pipes expanded by this process are made from heavy plates 40.5 feet in length, from 0.25 to 0.5 inch thick and from about 80 to 110 inches in width. The plates are put in presses which round them into tubes, and the seams are welded inside and out.

Expansion by water under high pressure is the final step. Pressure as high as 3,000 pounds per square inch may be used.

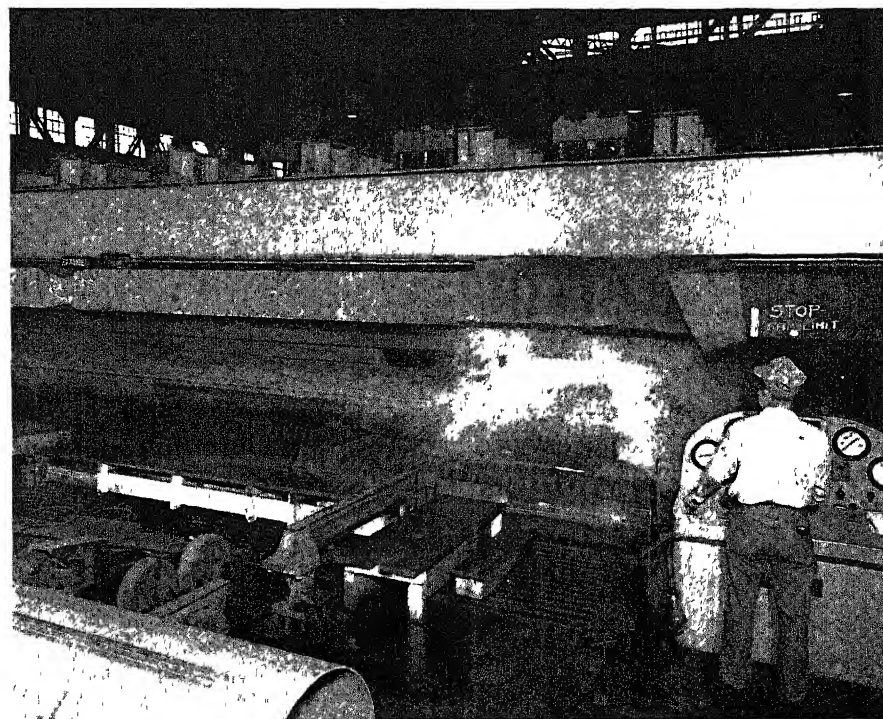
Science News Letter, August 19, 1950

SAFETY

Radioactive Materials Minor Hazard in Fires

➤ THE small quantities of radioactive materials now being used in several hundred research laboratories present only a minor hazard to firemen in case of a fire, according to the International Association of Fire Chiefs.

These hazards, however, should not be



PIPE STRETCHED—Water gushes forth after stretching diameter of steel pipe. Pressure is reduced before the ram is withdrawn from the unusual machine which uses the power of water under pressure to stretch the diameter of heavy pipe as much as one-half inch.

overlooked, these experts state in a report published and distributed by the organization. The booklet is particularly for fire departments that may be called to fight blazes in buildings where radioactive materials are present.

Radioactive materials produced by the U. S. Atomic Energy Commission are in use by over 430 organizations in the United States and 160 institutions in other countries. Over 12,000 individual shipments of 100 different kinds of radioactive substances have been made by the A.E.C. to institutions in the United States and 830 radioisotope shipments have gone to foreign countries.

The report offers safety precautions for

handling radioactive materials, and emergency procedures for fire fighting personnel in areas where such substances are used. It points out that "these radioactive isotopes and isotope-labeled compounds or tagged radio-chemicals are utilized in quantities so small that they do not of themselves contribute to the cause of fire, nor do they tend to increase the intensity of combustion."

Because a certain amount of radiation is continuously emanating from radioactive substances, under some circumstances a degree of hazard may be presented to fire fighters. "It is just as important that these hazards should not be unthinkingly exaggerated as it is that they should not be overlooked."

Science News Letter, August 19, 1950

METALLURGY

Tin as Semiconductor

➤ TIN is now being added to the small list of the strategic materials that will act as semiconductors, the class of substances that are extremely useful in electrical applications. Semiconductors also show promise as photoelectric cells.

This semiconducting tin, however, is not the same form of tin that is so familiar in tin cans. It is a special form of that element, having a different crystal structure. It is related to normal tin in a way similar to that in which diamond is related to carbon black. These two are the element carbon in different crystalline modification.

The unusual form of tin was first discovered more than 100 years ago. In 1833, in a church in Germany, it was noticed that certain of the organ pipes were crumbling away. This deterioration of the tin pipes made them look much as if they had been attacked by fungus disease, and the crumbling was known as "tin disease."

Some specimens of this different form of tin, or graytin, as it is now called were preserved, although the church organ pipes were replaced. Scientists today are thankful that these specimens were saved, for they find that it is extremely difficult to produce the unusual form of tin without first having seeded the laboratory with the rare crystals.

The reason for needing this seeding crystal is somewhat analogous to the reason that impurities are needed before water freezes at 32 degrees Fahrenheit.

In 1899 Ernst Cohen, a Dutch physical chemist, discovered that the gray metal found when the church organ pipes deteriorated was an allotropic form of tin. Little work had been done since then with this material until about two years ago, when Prof. G. B. Bush of the Physikalisches Institut Technischen Hochschule in Vienna

He presented a report of his work showing tin's promise as a semiconductor to the International Conference on Semiconductors held in Reading, England, recently. Other scientists had independently come to the conclusion that this unusual metal was

worth investigation. In this country, Dr. R. G. Bieckenridge, of the National Bureau of Standards in Washington, is directing his attention to growing single crystals of the substance.

The two most useful materials for semiconductors are germanium and silicon. Just below these two elements in the periodic table is tin. Normal tin shows only the expected metallic traits. The rare crystals, however, are in the in-between land of semiconductors.

Physicists divide matter into three groups when they are discussing its electrical properties. One group is the metallic conductors, those that readily transmit electricity. Another group is the insulators, conducting electricity to a negligible degree. Between these two groups lie the semiconductors.

The transistor is one of the devices developed to make use of the properties of semiconductors. It amplifies electric currents, and consists only of a tiny crystal of germanium with two closely spaced metallic points pressing on it.

Rectifiers are another use for the semiconductors. These materials find application in radar and television sets.

Science News Letter, August 19, 1950

METEOROLOGY

Quebec Crater May Be Mark of Ancient Meteorite

➤ THE world has another scar that may divert men's minds momentarily from the lesser but more dangerous possibility of atomic bombs blasting our cities.

Exploration of a supposed meteorite crater in northern Quebec, as reported from Toronto, creates great interest among geologists. It is an ice-filled basin, about two and a half miles across, believed by Dr. V. Ben Meen, director of the Royal Ontario Museum of Geology and Mineralogy, to be caused by a great object from outer

space that smashed into the solid granite crust of the earth. It is larger than Meteor Crater in Arizona.

The meteoritic origin of the Quebec crater has not been bolstered by the finding of iron fragments as in the case of the Arizona scar or similar natural phenomena in Siberia and Australia.

In the Carolinas there are depressions that were once supposed to be caused by similar giant meteorites striking the earth, but this theory is not now in favor. Less spectacular erosion is now believed to be the cause.

Snow and ice even in summer hamper the search for positive evidence of fragments of the Quebec meteorite, and other expeditions will be needed.

The two best authenticated meteorite falls both occurred in Siberia. One on June 30, 1908, in northern Siberia was recorded on earthquake registering instruments but its effect was not nearly that of the scars produced in Arizona and Quebec. On Feb. 12, 1947, another Siberian fall, near Novopokrovka, peppered the earth, but again it was small in comparison with the presumed Quebec occurrence of thousands of years ago, now discovered.

Science News Letter, August 19, 1950

PHYSICS

Uranium Is Superconductor At Very Low Temperatures

➤ FURTHER evidence that uranium, atomic bomb material, is a superconductor at extremely low temperatures is offered in Cambridge, Eng.

Drs. B. B. Goodman and D. Shoenberg of the Royal Society Mond Laboratory have found that uranium is a superconductor near absolute zero, 459.6 degrees below zero on the Fahrenheit scale. They also found that the temperature at which the metal became a superconductor varied with the amount of impurity present. They reported their findings in the British journal, *Nature* (March 18).

The phenomenon of superconductivity is a sort of "perpetual motion." There has been a certain amount of controversy among scientists as to whether uranium was superconducting near absolute zero.

A startling demonstration of superconductivity can be made by cooling a superconducting metal saucer until it is close to absolute zero. A bar magnet brought close to the saucer sets up an electric current in the metal. This causes a resistance to the further movement of the bar magnet toward the saucer. The magnet then floats above the saucer, literally suspended by nothing, like the legendary Mohammed's coffin.

Although at present time there are no practical applications of the strange behavior of some metals at very low temperatures, researches at these temperatures are helping us to learn more about the properties of matter.

Science News Letter, August 19, 1950

MEDICINE

Polio Quarantine Useless

By the time an epidemic of polio is evidenced, every one has already come into contact with it. However, it is wise to avoid travel, visits and new contacts when possible.

➤ EVERY summer countless families throughout this land are made to feel like "modern day lepers," as one of them puts it.

The reason is that a child or some other member of the household has come down with polio. Good friends and neighbors who would ordinarily rally to help in time of trouble shun the victim's family.

In some communities you can tell where a polio victim lives, even though no health department quarantine placard is on the door. The neighbors cross the street to avoid passing too close and their children are hastily snatched back if they ride their tricycles or chase a ball across the invisible line.

All this causes needless mental suffering on the part of both the victims and the neighbors and friends who are miserably stifling their natural desire to help and show sympathy.

Strict and heavy quarantining for infantile paralysis does not stop polio epidemics, health and poliomyelitis authorities agree. All attempts to stop polio by quarantine have failed and authorities now consider it foolish to enforce it.

Shunning the victim's family is like locking the barn door after the horse was stolen.

Here is how the National Foundation for Infantile Paralysis explains the situation: By the time an epidemic of polio is noticeable, the whole community has been well seeded with the virus that causes the disease. Every one has already come in contact with it. Those who are susceptible will get polio. Those who are not susceptible will escape being sick.

The incubation period, that is, the period between the time the virus gets into the human body and the person gets sick, is from three to 35 days. Your child may have gotten the virus at the same time your neighbor's child did. One of them may get sick three days later and the other seem perfectly well for a month before he comes down. But for that entire month he would be harboring the virus in his body. So keeping him and his family away from the first victim's family will not protect the second child.

National Foundation and other authorities do advise that you avoid travel and visits with people you do not see regularly and avoid new contacts where possible. If polio is not already in your community, you may not have gotten the virus. So you avoid contacts with people in another community who may already have the virus, even though they are not sick.

While no one knows exactly how polio spreads, authorities are agreed that it is through the intimate contact of close, daily living. Members of a family or household using the same dishes, children in a family or neighborhood playing with each other's toys are examples of this kind of contact. But no one knows until the first case develops whether anyone in the group has the virus. And by the time that first case develops, it is too late to stop its spread. Every one in the group is likely to have it, though they may not all get sick.

If you think of a bull's eye on a target with concentric rings around it, you get a good idea of the polio situation. The bull's eye is the center of the polio situation and the farther out the rings get, the fewer the cases.

A recent careful study of a polio patient's contacts showed this. Examination of stools from all the contacts showed that the patient's mother, father and 80% of his brothers and sisters were harboring the virus.

Among relatives and friends who came often to the house and occasionally spent the night, 20% were harboring the virus. Among acquaintances who came only once in a while for a brief visit and among boys and men delivering milk, groceries and the daily newspaper, only 5% were harboring the virus. Not all of these people actually got sick, they just had the virus in their bodies.

So if you are within the close circles of relatives and friends or neighbors who often stop in for meals, overnight visits and the like, you cannot protect yourself or your children by suddenly shunning all contact with the polio victim's family. But if you are in the outer circle of once a year visits or five-minute calls, you may protect yourself and your family by staying in that circle.

Science News Letter, August 19, 1950

ARCHAEOLOGY

Stone Javelin Heads, Much Like Yuma Points, Found

➤ DIGGING with a bulldozer under 20 feet of dirt deposited by winds and floods of centuries, scientists of the Smithsonian Institution found a site where Indians had camped some 5,000 years ago. The discovery was made at the Angostura reservoir near Hot Springs, S. D.

Under the direction of Richard P.

Wheeler, they dug up some ancient stone javelin heads. With the stone weapons were some animal bones, in such bad condition that it is impossible to tell whether they are the remains of extinct animals or whether they are of species still living.

The javelin heads are very much like the Yuma points found some years ago in New Mexico together with the fossils of extinct animals. The Yuma points are the finest job of flint chipping found in the New World in spite of their great antiquity.

The Angostura site is one of a number of reservoir sites being explored for archaeological treasure before they are flooded.

At the Garrison Reservoir in North Dakota, archaeologists under the direction of G. Ellis Burcaw found a fortified Indian village like others previously found along the Missouri River. The village is encircled by a moat and stockade built on packed earth walls with watchtowers at frequent intervals. It is like the European fortified villages of the Middle Ages, but was built in America before the coming of the white man.

Science News Letter, August 19, 1950



"LUMPY"—A manikin developed by the Army's Quartermaster Corps, gives information on the types of design and dimensions of sleeping bags which give the best protection against external cold. Electrical heat units underneath Lumpy's underwear are used to determine heat loss. The tendency of his internal stuffing to bulge in unpredictable places caused him to be dubbed "Lumpy."

ENTOMOLOGY

Mold Chemical May Kill Insects and Mites

➤ A MOLD chemical distantly related to streptomycin may turn out to be a good insect and mite killer, Drs. George S. Kido and E. Spyhalski have discovered in tests at the Insecticide Testing Laboratory of the Wisconsin Alumni Research Foundation in Madison, Wis.

The chemical is called antimycin A. It comes from an unidentified species of *Streptomyces*. Streptomycin also comes from a species of *Streptomyces*.

The mold chemical kills insects that eat it. It does not kill just by being in contact with the insects' bodies. Houseflies sprayed with a solution of the chemical showed no ill effects, whereas 38% of those that fed on a ball of cotton saturated with it were dead in 24 hours.

Antimycin A is also rather choosy about which insects it kills. German cockroaches and the larvae of the webbing clothes moth were not affected, but carpet beetles were stopped from eating fabrics treated with it.

Among agricultural pests, the chemical was effective against second instar Mexican bean beetle larvae but not against the fourth instar Southern army worm.

Antimycin A can kill other pests besides insects. It is about three or four times more effective against the red spider mite than the commercially available anti-mite chemical, di-(p-chlorophenyl) methyl carbonyl, or DMC for short.

Details of the tests of this new mite and insect-killing antibiotic appear in the journal, *SCIENCE* (Aug. 11).

Science News Letter, August 19, 1950

MEDICINE

Anti-Tuberculin Vaccine Traced Through Body

➤ BCG vaccine against tuberculosis has been made radioactive and is now being tested by Dr. L. Strom of Stockholm.

The radioactive vaccine was made in order to trace its path in the body.

TB germs for the vaccine were made radioactive by growing them in a medium containing radioactive phosphorus. When injected into the muscles or bellies of guinea pigs, these radioactive TB germs were found to spread very rapidly.

Some experiments were made on humans, injecting the radioactive vaccine into the skin. A Geiger-Müller counter specially devised for use on the skin traced the course of the vaccine. It followed the lymph gland drainage of the area and spread within a few minutes.

The activity of the vaccine is now being investigated in the blood and urine. Presence of radioactive phosphorus in the urine

may be the result of the disintegration of the germs and their elimination from the body.

BCG vaccine, named for bacteriologists Calmette and Guérin, is made of living tuberculosis germs that have been greatly weakened. As a result, they should produce immunity against the disease without producing the disease. The vaccine has been more widely used in Europe than in the United States.

His studies were reported at the International Congress on Pediatrics.

Science News Letter, August 19, 1950

MEDICINE

Potassium Doses For Infant Diarrhea

➤ LIVES of many babies may in future be saved by a new treatment for infant diarrhea devised by Dr. Daniel C. Darrow of Yale University in New Haven. The treatment consists in giving doses of the mineral, potassium.

"The infants looked much more vigorous while the diarrhea continued and did not collapse in the manner that has been observed when no potassium is given," he reported.

"Deficit of potassium is quite regularly present in severe diarrhea," he stated, "and responds to appropriate replacement treatment with a striking decrease in mortality."

The potassium treatment is intended to overcome the acidosis which occurs in infant diarrhea. This acidosis has usually been considered the result of two factors: 1. loss of alkaline intestinal secretions in diarrhea, and 2. failure of the kidneys to secrete an acid urine as they normally do.

These two factors do not adequately explain the acidosis, Dr. Darrow and co-workers found. Instead they discovered that a curious disturbance occurs in cell metabolism as a result of which sodium, the chief alkali of the blood serum and the lymph, or fluid between the cells, passes into the body cells. This depletes the blood alkali and causes acidosis.

At the same time potassium, a normal ingredient of cell fluid, is replaced by the entering sodium and is lost by the body. It is not clear which comes first—the loss of potassium from the cells or the entry of sodium into the cells. Both seem to occur simultaneously.

Dr. Darrow tried giving potassium on the theory that this might check the loss of potassium from the cells and thereby prevent or impede the entry of sodium into the cells.

This treatment, he found, tended to correct the acidosis as well as to restore normal cell function.

His studies were reported at the International Congress on Pediatrics.

Science News Letter, August 19, 1950



MEDICINE

Be Quiet After Radiation Exposure

➤ ANYONE exposed to radiation from an atomic bomb explosion or an overdose of X-rays should lie down and keep quiet if possible. Experiments with rats at the Naval Radiological Defense Laboratory in San Francisco, Calif., show that irradiation with X-rays is much more killing if it is followed by violent exercise.

After irradiation with 600 roentgen units all the nonexercised rats survived, but among those with the same dosage who had less than 30 minutes of exhaustive exercise a day, 50% died, Drs. D. J. Kimeldorf, D. O. Jones and M. C. Fishler report in the journal *SCIENCE* (Aug. 11).

When the dosage was upped to 700 roentgen units, 44% of the resting animals died, but this dosage was fatal to 92% of those who exercised.

Not only did the rays kill a greater proportion among the exercised animals but those that died survived for a shorter time than did the animals without exercise.

Reason for the increased lethal effect of the rays on exercised animals is believed to be the raised metabolic level after exercise. Previous experiments showed that fertilized ascaris eggs, frogs, chick embryos and newborn rats have greater resistance to radiation when kept at low temperature and thus at lowered metabolic activity.

Science News Letter, August 19, 1950

INVENTION

Device Helps You Detect Your Own Bad Breath

➤ YOU can smell your own breath with an invention for which the government issued a patent recently. No longer will it be necessary to ask a friend if your breath is bad.

With this device, a sample of the breath from within the mouth is taken. Then the sample is discharged into a nostril. The sampler is a tubular affair, constructed in two parts, one of which slides within the other.

To use, one end in which there is a small opening is held between the lips. The other half is drawn outward to create suction to pull air from the mouth into the device. By reverse action, this mouth-air is then forced into the nostril.

Any unpleasant odor in the breath is easily detected, the inventor claims. He is Robert M. Glidden of Haddonfield, N. J., and the patent number is 2,517,657.

Science News Letter, August 19, 1950

MEDICINE

Terramycin Effectively Treats Pneumonia

➤ "EXCELLENT" results in every case of pneumonia treated, with no failures, is the latest box score for one of the newest mold drugs, terramycin

The results are reported by Drs. George W. Melcher, Jr., Count D. Gibson, Jr., Harry M. Rose and Yale Kneeland, Jr., of Columbia University College of Physicians and Surgeons and Presbyterian Hospital, New York, in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Aug 12) in Chicago, Ill.

These doctors used the new drug to treat 18 patients with lobar pneumonia due to a pneumococcus and seven patients with atypical or virus pneumonia

A "dramatic" fall in temperature occurred in all but one patient within 24 to 36 hours after the first dose. In many cases the patients began to feel better even before the temperature started to drop. One man had completely lost the pain in his chest and his cough was much better within 12 hours after the first dose of the new drug.

Science News Letter, August 19, 1950

GEOLOGY

Old Faithful Not as Faithful as Believed

➤ OLD Faithful, hitched all winter to a newly-developed "geyser counter," has shown it is not so faithful after all.

The overall average for time intervals between 2,606 eruptions, clocked by a gadget put together by Yellowstone Park rangers from a seven-day clock and an electrical magnet, was 63 minutes and 15 seconds, Ranger Ruben O. Hart writes in the Park bulletin, YELLOWSTONE NATURE NOTES (July-August).

But Old Faithful waited only 38 minutes in giving its quickest repeat performance. It stalled for 88 minutes on another occasion.

Science News Letter, August 19, 1950

WILDLIFE

Good Duck-Hunting Foreseen for 1950

➤ THERE was good news for most of the nation's duck hunters recently.

Summer surveys on the breeding grounds of wild ducks and geese from the Canadian border north to the Arctic Sea show that there will be nearly as many waterfowl winging south over three of the country's

four major flyways this fall as in 1949. Results of the annual census were reported by Albert M. Day, director of the U. S. Fish and Wildlife Service.

Fair weather and favorable breeding conditions seem to have offset a threatened 25% drop in continental waterfowl populations reported last winter by wildlife biologists in the annual southern census.

For the Pacific Coast, Great Plains and Atlantic flyways, the Fish and Wildlife men now report, the wildfowl situation appears to be the same or only slightly less favorable than last year. Only in the summer breeding areas supplying ducks to the Mississippi Valley flyway has a "moderate" decrease been found.

The waterfowl surveys, this year more extensive than ever before, are made in cooperation with the Canadian Wildlife Service and the various state and provincial governments of the U. S. and Canada.

Science News Letter, August 19, 1950

GENERAL SCIENCE

War Production Depends on Factories All Over U. S.

➤ THE job of stepping up production of airplanes, automobiles, war tanks and other complicated equipment needed in war emergencies is not as simple as merely going from an eight-hour to a 24-hour workday. The output of most large concerns depends upon a supply of parts from widely scattered smaller manufacturers.

Airplane production, for example, depends upon the availability of engines. Engine production depends upon a plentiful supply of parts manufactured by many companies. The output of these manufacturers of parts depends upon the availability of raw materials.

Among the engines widely used by the armed services are those manufactured by Pratt & Whitney Aircraft, East Hartford, Conn. A survey just made by this company shows that its subcontractors and suppliers have reached a total of 4,604 concerns. About half of them are located in New England. The others are distributed from New York to California and Texas.

As an example of engine work done outside the East Hartford area, the heat measuring device used on Pratt & Whitney jet engines is made in Springfield, Mass. Also in this same city a concern employing 450 men cuts gears on the Pratt & Whitney engines. And a Connecticut firm makes the precision screws and pins for the same power plants.

Manufacturers of all types of automotive vehicles depend similarly on many widely scattered makers of small but essential parts. A relatively few centers in the United States are recognized for automobile production. Actually parts for automobiles are manufactured throughout the nation by firms located in practically every state.

Science News Letter, August 19, 1950

VETERINARY MEDICINE

BW, Wartime Weapon, Helps Combat Newcastle Disease

➤ BW, dread wartime weapon which spells out as bacteriological warfare, is being turned to a peacetime use in Berkeley, Calif., by veterinarians seeking new ways to combat a serious, fast-spreading ailment of chickens, Newcastle disease.

Air saturated with a weak strain of the virus of Newcastle disease is fed to young chickens in special pens at the University of California. The disease spray, instead of striking down the chickens, makes them immune to more virulent forms of the Newcastle virus.

The experiment, being carried on by Dr. Raymond A. Bankowski and associates on the University research staff, is described in the JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION.

Virus used in the air-borne sprays was weakened by growing it for long periods in the laboratory in a special broth preparation. It seemed to lose most of its disease-producing properties while retaining the power to immunize.

Ordinarily, chickens are vaccinated against Newcastle disease much as humans are protected against smallpox. The disease virus is injected under the skin.

In the new method the young birds are kept in virus-laden air for periods up to an hour, being gassed by disease germs as a protection against a poultry plague.

Science News Letter, August 19, 1950

SOCIOLOGY

Outlook for Marriage: No War Boom This Time

➤ THERE will not be much of a war boom in marriages this time. The reason is there are not very many spinsters and bachelors left in the country.

"At present somewhat more than two-thirds of the population at ages 15 and over is married," report statisticians of the Metropolitan Life Insurance Company here.

The number of married people in the United States, estimated at almost 75 million, is now at an all time high. Only 10 years ago there were 14 and one-half million fewer married men and women in the nation.

While most of the increase in the married population has come from the war and postwar boom in marriages, some of it has come from improvement in mortality which has resulted in fewer widows and widowers.

The number of weddings has been declining from the postwar peak which, the statisticians say, is not surprising in view of the marked depletion of single men and women throughout the country.

Science News Letter, August 19, 1950

PHYSICS

A-Bomb: Mass Murder Design

A 400-page report, "The Effects of Atomic Weapons," by Atomic Energy Commission and Department of Defense, tells everything possible about atomic attack.

By SAM MATTHEWS

The volume's flyleaf carries these words: "The Civil Defense Office, National Security Resources Board, commends this publication as a source of scientific information for technical personnel engaged in civil defense planning activities. Its detailed description of the physical phenomena associated with atomic explosions provides certain basic data helpful in the preparation of practical plans for atomic warfare defense."

➤ IT is mid-afternoon. An atomic bomb explodes over your city. In the first great flash of light, equal to 100 suns, the buildings stand etched against a sky of fire. Then the buildings fall.

You are two miles from "ground zero," the point directly beneath the bomb's burst. You will be burned, but you will live—if the bomb is no stronger than the one this country dropped on Japan.

Your wife is downtown shopping. You never see her again. Less than half a mile from ground zero, she is hit almost simultaneously by three waves of force, each powerful enough to kill.

The first and the second arrive as one—flash heat, thousands of degrees hot; and invisible, penetrating nuclear radiation, deadly gamma rays and neutrons. Then, a second later, the blast wave strikes. The city is crushed under a giant hand.

Atomic energy is energy on a scale never before released by man. What happens if it is released as a bomb? Suppose, as do the scientists at Los Alamos, that a "nominal atomic bomb" is dropped over your town.

The bomb is the equivalent of 20,000 tons of T.N.T. Expressed in electrical energy, it is roughly equal to the daily output of Hoover Dam, or enough to burn a 100-watt bulb for 263,000 years. Yet this tremendous force can be released in the complete fission of only 22 pounds of uranium 235. It happens in less than a millionth of a second.

A blinding ball of fire leaps from the point of burst. The initial temperature of the exploding bomb is more than 1,000,000 degrees Centigrade. The pressure is of the order of hundreds of thousands of atmospheres.

Complete destruction will occur within a mile-wide circle. Small masonry buildings will be engulfed by pressure and collapse completely. Light buildings and homes

will be totally demolished by blast and fire. Factories of steel will be stripped of roofing and siding and only the twisted frames will remain. Buildings will lean away from ground zero as though struck by a hurricane of stupendous proportions.

Chances of anyone surviving within 2600 feet—half a mile—of an atomic explosion are very poor, the scientists say bluntly. Victims within that circle will either be killed by blast, crushed by falling buildings, burned to death or given a greater-than-lethal dose of radiation.

The heat wave which precedes the blast front will last about three seconds. It will set flash fires and char combustible materials. Human beings exposed to it will receive more or less serious skin burns if within two miles of ground zero.

Heat Travels Straight Line

This heat travels only in a straight line. Hence protection from it is afforded by almost any object. Clothing shields the body, or even a tree trunk. When an A-bomb bursts, AEC's handbook says, drop to the

ground and curl up in a ball to escape the flash.

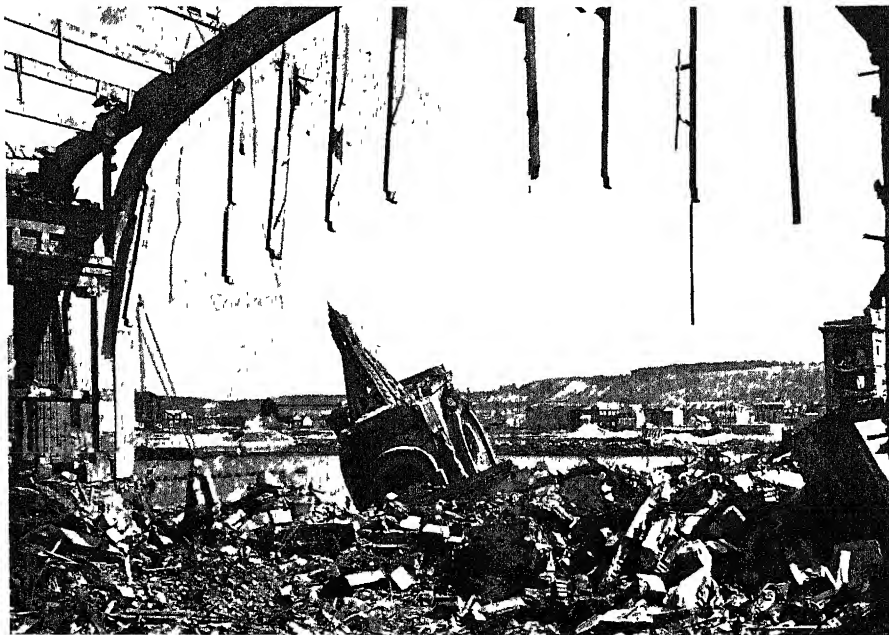
Burns from flash heat and ordinary flame caused more than half the deaths and three-quarters the injuries at Hiroshima and Nagasaki. There were no fire departments after the explosion. Water pressure in the city mains was practically zero. Twenty minutes after the blast came the "fire storm," wind blowing into the holocaust from all directions, 30 to 40 miles an hour at its height.

Unmatchable Third Explosion

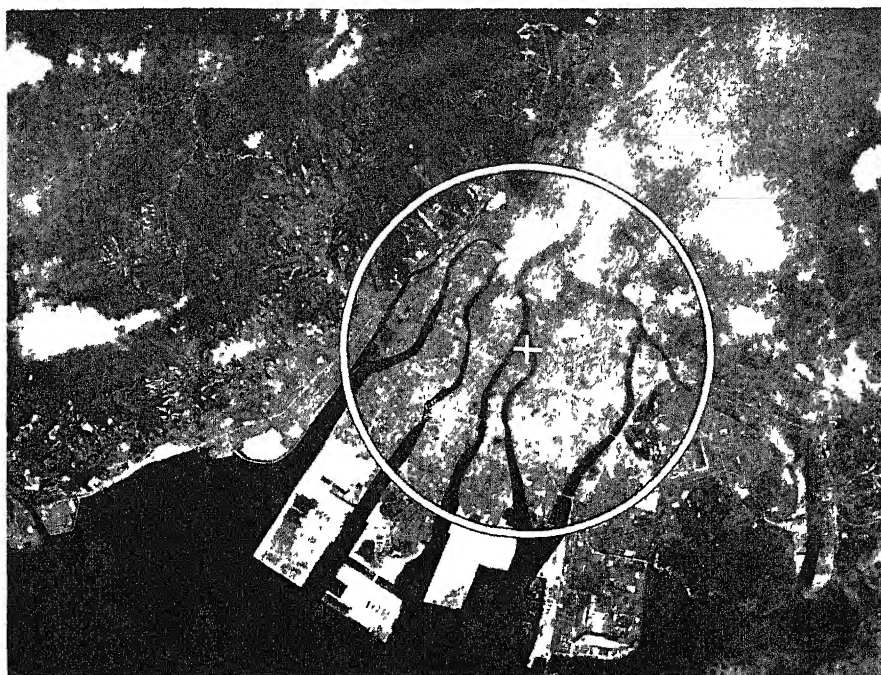
Atomic weapons have a third explosion of energy, the only one which a conventional explosion cannot match on its smaller scale. This is the wave of invisible energy which produces radiation sickness, striking the single human cell in the bone marrow, the blood and the living tissues.

Gamma rays and neutrons are the dangerous particles of energy in this wave to victims of atomic warfare. Shielding from these rays is a matter of reinforced concrete by the foot or solid lead inches thick.

Gamma radiation (X-rays) from a nominal atomic bomb will kill at 4200 feet from the burst. Neutrons are lethal up to half a mile. At 3000 feet from the burst, there is a better than 50% chance you would be killed by this nuclear radiation alone, even



CHERBOURG SHAMBLES—Allied forces during World War II reduced the French port of Cherbourg to these ruins. Weeks of bombardment by ordinary high explosives were required to cause such damage as this. Yet one atomic bomb, of the earliest type used on Hiroshima, can turn an entire city into similar shambles in 10 seconds.



HAVOC OF HIROSHIMA—The heart of Hiroshima was ripped out by the atomic bomb. The picture was taken by the AAF the day after the bomb fell. A mile-wide area, shown within the white circle, was completely flattened.

if you are shielded by 12 inches of concrete

A lethal dose of radiation will have these immediate effects: Varying degrees of shock, possibly within a few hours, nausea, vomiting and diarrhea in the following day or two; then fever. Often there will be no pain in the first few days, but merely a feeling of discomfort, marked depression and fatigue.

The early stages of severe radiation sickness may be followed by two or three days when the patient is free from all symptoms, although profound changes are taking place in the body. Then the earlier symptoms reappear. Active illness is soon followed by delirium, coma and finally death. The patient dies usually within two weeks. Infection, internal bleeding, swelling of the throat, loss of hair and degeneration of the sex organs are apt to occur.

Effect on Posterity

AEC scientists and genetics experts are extremely cautious in discussing one vital question: will the children or grandchildren of atomic victims be human monsters? Chromosomes and genes, biological factors which control heredity, are changed by radiation. Risk of passing on changes in chromosomes can be reduced if atomic victims "refrain from begetting offspring for a period of two or three months following exposure," the report states.

It adds that this precaution probably would not lessen the risk of passing on changes in the genes. Until large gaps in man's knowledge of radiation in genetics are closed, say the scientists, estimates of

what can or may happen will be little better than guesses.

Will your city be left an echoing ghost town, too "hot" with radioactivity to be entered? If the bomb explodes high in the air, the report says, this hazard will be extremely small. The radioactive residue of the bomb itself will eventually fall to earth, but the small amount of these fission products and the wide area over which they will be dispersed lead military men to discount almost completely any real danger from them.

However, the "base surge" of water from an underwater atomic explosion, or dirt thrown by a bomb exploded either at street level or underground, will be intensely radioactive. Lethal levels of radiation in the wake of such bombs are possible.

If an atomic bomb were a fizzle, unexploded radioactive material might settle over a limited area in high enough concentration to be dangerous. The AEC-Defense Department report says such fizzes are entirely possible. Atomic bombs can explode only partially, breaking apart and scattering their substance into the atmosphere.

Radiological Warfare

Radioactivity might be deliberately sown without bombing, as a new weapon of war. In the report, the wraps are officially pulled off the terrifying possibility of radiological warfare.

Radioactive materials can be made in an atomic pile. Small amounts of certain elements can be made to give off tremendous

amounts of radiation when so treated. If these could be spread uniformly over a given area, such as a city, that city might perhaps be denied for habitation or industrial use.

But who will do the spreading, and how? So great would be the difficulties in using radioactive materials that such weapons may be impractical. Nevertheless, warn the atomic scientists, the panic-inspiring potential as a "mystery weapon" makes radiological warfare a grim possibility to be taken into account in civilian defense planning.

How to Decontaminate

Ships at Bikini were "hot" after the underwater burst. Much of what was learned at Bikini about decontamination, hitherto kept classified, is revealed in the report.

Gas masks and protective clothing will be necessary for rescue workers. Radiation detectors, such as Geiger counters, will be vital.

Once made radioactive, an object can be: 1) buried deep in the earth or jettisoned at sea; 2) kept isolated until the radiation lessens; or 3) decontaminated below the dangerous level.

In most instances, this means cleaning or removing the surface of the radioactive object, whether it be a tank or an office building. Certain chemicals have been found effective. Blasting with wet sand or high-pressure steam containing a detergent were Bikini-tested measures. Ordinary household cleaners might be used. So too might powerful acids or other corrosives.

Danger of Panic

Panic is the final danger in the minds of the atom scientists. "Mass hysteria could convert a minor incident into a major disaster," they say.

The first atomic bomb at Hiroshima killed 78,150 people, which seems far from a "minor incident." But if an American community—anywhere—were to be atom-bombed, panic would strike 80 out of 100 of the physically unharmed survivors. Tens or hundreds of thousands of Americans in other parts of the country might desert their homes and jobs from sheer terror. The great industrial centers of the nation might suddenly become empty shells.

Not a World Hazard

Could the entire world be contaminated by deadly radiation from atomic bombs? "It has been calculated," says the report, "that in order to constitute a world-wide hazard, something like a million atomic bombs, of the nominal size, would have to be detonated, roughly one to each 200 square miles of the earth's surface. This clearly represents a highly improbable situation."

MEDICINE

Anti-Atherosclerosis Diets

More rigid diets to prevent artery hardening are needed than those previously used. Diets must practically exclude lean meats, skim milk and dairy products.

► PATIENTS and their doctors trying to ward off the dangerous artery hardening condition, atherosclerosis, by a low-cholesterol diet will need to prescribe and follow a much more rigid one than generally used for this purpose, it appears from studies at the University of Minnesota in Minneapolis.

The anti-atherosclerosis diets are based on the assumption that the amount of the fatty substance, cholesterol, eaten is reflected in the amount of this substance in the blood serum. This, in turn, is presumably reflected in a tendency to develop atherosclerosis.

But the amount of cholesterol in the blood serum cannot be significantly reduced, the Minnesota studies show, by diets that allow ordinary amounts of lean meats and permit use of skim milk, and that do not rigidly exclude from every item of cookery and baking all dairy products, eggs and animal products.

The studies, by Dr. Ancel Keys with the collaboration of Dr. Olaf Mickelsen now with the U. S. Public Health Service, Miss Erma v. O. Miller and Dr. Carleton B. Chapman, are reported in the journal, *SCIENCE* (July 21).

The amount of cholesterol in the blood serum of normal men, these scientists found, does not vary with cholesterol intake

from food over a range of something like 250 to 800 mg per day. In other words, one normal person can eat three or more times the amount of cholesterol as another person and still not have any more cholesterol in his blood.

If, however, cholesterol intake is completely eliminated, as in the rice-fruit diet for high blood pressure, the amount in the blood serum goes down markedly and rapidly.

Eliminating cholesterol and all animal fats, which could be a source of the chemical, but allowing vegetable fats caused a rapid return of cholesterol in the blood to a high level in one patient whose blood cholesterol had been markedly reduced. This suggests that vegetable oils in the diet promote accumulation of cholesterol in the blood.

"It is doubtful," states Dr. Ancel Keys who directed the studies, "whether most so-called low cholesterol diets in current use reach critical levels or have significant utility for the purpose of their use."

With a much more rigorous diet, he states, an effectively low level of cholesterol in the blood can be achieved, but "halfway measures may be useless."

Science News Letter, August 19, 1950

GEOLOGY

Study Evaporation Secrets

► THE case of the vanishing water—trillions of gallons licked up by evaporation each year from the nation's reservoirs—is being studied by government scientists at a saucer-shaped lake outside Oklahoma City.

Secretary of Interior Oscar Chapman announced the start of a 13-month survey of this guinea-pig reservoir by specialists of the U. S. Geological Survey, Weather Bureau and a three-man Naval team.

With complex electronic instruments to measure the sun's energy at lake surface, plus the effects of wind and humidity on evaporation, this "Oklahoma Navy" task force will provide basic data for a new method of measuring water losses from reservoirs in the West's rapidly-growing chain of reclamation and power projects.

Oklahoma's Lake Hefner was picked for the study because it most nearly met the scientists' specifications: a saucer several miles in diameter with a bottom that does not leak (red Oklahoma clay is virtually

watertight). Every gallon of water going in or out can be accurately measured. The difference in a perfect system can be charged to evaporation.

This so-called "water budget" method of measuring evaporation is the old way, however, and none too accurate. The Weather Bureau uses evaporation pans, charting the rate water vanishes under solar radiation and wind and applying the figure to larger bodies of water. Scientists have long suspected that this method is not accurate either—that there is a big and varying difference between evaporation from a shallow pan and from a reservoir, lake or ocean.

Two new techniques will be checked by the new study: "energy budget" calculations based on the sun's radiation, and a "mass transfer theory" built on mathematical equations concerned with the physical removal of water to the atmosphere.

"Such data," said Secretary Chapman, "will be of tremendous importance for the planning of future water resources develop-

ment in the western states." Engineers will use evaporation information in deciding where and how big future dams may best be built.

Science News Letter, August 19, 1950

PHYSICS

Cosmic Ray Bull's Eye Shot 100 Miles Above Earth

► THE first photograph at 100 miles above the earth of a cosmic ray smashing an atom to bits has been taken from a V-2 rocket.

The photographic plates recovered in this V-2 flight showed more than three times as many cosmic ray collisions at the 100-mile level than appear 20 miles up, preliminary results show.

Prior to the successful photograph from this V-2 rocket, most photographs of cosmic particles smashing atoms were obtained by using free balloons that did not travel higher than 20 miles. Several previous attempts to get good photographs of cosmic rays from rockets were unsuccessful.

The photograph was made possible by a special plate holder designed by Dr. Herman Yagoda and co-workers at the Experimental Biology and Medicine Institute of the National Institutes of Health in Bethesda, Md.

This container protects the fragile photographic emulsions so that they can withstand shocks in the firing and landing of the rocket. It also protects from the vapors of the rocket fuel. Hydrogen peroxide particularly causes rapid destruction of the images.

The energetic cosmic rays that made the stars on the photograph penetrated through the rocket to get a direct hit with the nucleus of an atom in the photographic emulsion. The tiny building blocks of which the smashed atom were made splattered out into the surrounding emulsion. Since many of the particles thus made are charged, they leave tracks in the emulsion that can be seen microscopically in the developed plate.

Science News Letter, August 19, 1950

AERONAUTICS-CHEMISTRY

Fire-Extinguishing Gases Cut Plane Crash Deaths

► MANY lives would be saved in airplane take-off and landing crashes if better automatic fire-extinguishers were installed, experts in Washington state. The fire-extinguishing gas now used is largely carbon dioxide. More effective gases are available.

In England, methyl bromide is being used exclusively for engine fire protection, Jesse W. Lankford of the Civil Aeronautics Board recently stated. He is an authority on airplane fire prevention and has inspected recently the British systems. Methyl bromide is more effective than carbon dioxide.

In America, little methyl bromide is used for this purpose because the gas is toxic. However, when used within the engine housing, where crash fires start from broken fuel lines and highly heated engines, there is relatively little danger to passengers and crew.

However, another gas, said to be equally as effective and not as toxic as methyl bromide, is now coming into use in American planes. Technically, the gas is monochlorobromomethane, called C-B for short. Both civil and military authorities are fully aware of the need of better fire protection in planes and are pushing forward plans to convert from carbon dioxide to C-B extinguishers as rapidly as practical.

At the present time, as well as during the past few months, giant Air Force bombers of the B-29 type are being converted to

C-B. The same distribution system is being used, with the C-B in liquid form stored in a steel sphere with the fuselage. It requires only one-fifth the operating pressure needed for carbon dioxide.

In the British system utilizing methyl bromide, according to Mr. Lankford, separate containers for the chemical are located in each engine housing, the nacelle. This localizes the supply, in contrast to the more common American system of a central supply piped to the nacelles. In a crash such pipelines may become inoperative.

In the British system the fire extinguisher in each nacelle is connected with an impact switch which triggers automatically at a given deceleration force. However, they can be discharged selectively from the cockpit when it is desirable to do so

Science News Letter, August 19, 1950

METEOROLOGY

Atmosphere Study Aid

➤ WIND velocities and temperatures of the little-known part of the earth's atmosphere 20 to 40 miles high will be studied by sound waves in the first large-scale, long-term program of its kind

In an area 300 miles wide in diameter, explosions of 200 pounds of TNT will shoot sound waves 40 miles into the sky. When these waves reach a heated area of atmosphere, the inversion point, they will be refracted, traveling back to earth 150 miles from their starting point.

Here they will be picked up on specially constructed microphones and recorders. These waves will be in the low frequency range, so low that people cannot hear them. The rarefied upper atmosphere screens out the high frequency waves, Col Victor Huffsmith, supervisor of the program for the Denver University Institute of Industrial Research in Denver, Colo., explained. A grant from the Air Forces Cambridge Research Laboratories has made the project possible.

In a way similar to that by which seismologists can learn about the structure of the earth's interior by the nature of the waves sent out by earthquakes, so these men will be able to tell certain conditions of the atmosphere by the nature of the waves sent out by TNT explosions. The air velocity and temperature of the particular area of the atmosphere will be determined by the time of travel and by the angle at which the waves return to the earth

The nine-man staff of Institute researchers will be divided into four teams. Three in the field and one at the Institute in Denver. In the area around Wray, in north-eastern Colorado, nine stations with the TNT will be set up. They will be 25 miles apart, in the shape of a cross. One field team will detonate the TNT in one arm

of the cross, while the other two teams, traveling in a circle 300 miles in diameter, will pick up the sound waves as they travel back to earth

These field teams will be in constant touch by radio with each other and with the Institute in Denver. Data will be calculated, analyzed and evaluated in Denver.

The technique of measuring sound waves from the upper atmosphere was worked out recently by the Cambridge Research Laboratories and given a short-range test in Panama and Alaska. At that time, army planes dropped bombs in the ocean and stationary teams recorded the sound waves.

This sound wave technique is superior to the use of either balloons or rockets in atmospheric research. Balloons sent skyward to radio back weather conditions can reach maximum elevations of only 20 miles. Although V-2 rockets can soar considerably higher, the expense of the missile and radio equipment is high, and both are often destroyed without providing the information sought.

Science News Letter, August 19, 1950

AERONAUTICS

New Omrange Stations Near Completion

➤ OVER three-fourths of the new-type radio stations that provide "beams" for air pilots to follow are now in operation, officials of the U. S. Civil Aeronautics Administration state

Slightly over 400 stations will be needed to blanket the entire country with these very high frequency radio beams. Over 300 are already erected and others are rapidly being installed.

This most modern pilot-guiding system, known as the omrange, is so called because it provides radio beams in all direc-

tions, instead of only four as in the radio range system it is replacing

Important, also, is the fact that the beams are of very high frequency which means that they are practically static-free. This is not the case with the beams of the older radio range.

Very high frequency radio waves follow a "line-of-sight" course. Thus they can be picked up by a ground station only some 40 to 50 miles from the ground station in which they originate, as owners of television and FM receivers have learned from experience

But planes in the air can pick up very high frequency waves at much greater distances because hills and mountains do not cut their path. They can be received at 100 miles or more by planes at 5,000 feet altitude. The maximum reception distance from the stations being erected is approximately 200 miles for a plane at 20,000 feet

These omrange beams will be available for all planes—military, commercial and private. Planes must be fitted with special radio receivers that vary in price from \$400 upward. The receiver is connected to four basic instruments in the cockpit

One instrument is a radio dial for tuning, another is a bearing selector, the third is a round dial with vertical needle hinged at the top, and the fourth is an indicator to tell whether the bearing shown is to or from an omrange

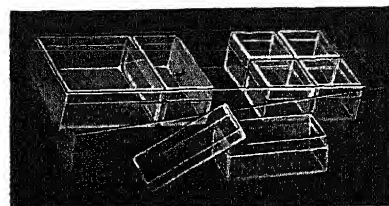
For the benefit of pilots, public and private, the Civil Aeronautics Administration has issued a booklet to tell them how to use the omrange. Information on local omrange sites can be obtained from most of the CAA regional offices.

Science News Letter, August 19, 1950

Irish moss, a seaweed found on the coast from Massachusetts north, yields a gelatinous material called carrageenin, one use of which is to keep cocoa suspended in chocolate milk.

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ZOOLOGY

NATURE
RAMBLINGS

Pronghorn

➤ FOR long distances the prong-horn antelope, fastest of all four-footed animals in America, can cover the countryside at 45 miles an hour. In sprints they can put up the pace to close to a mile a minute.

Since the early days of the West, when pronghorns roamed in herds as large as those of the bison, the sharp, snorting whistle of this fleet antelope has sounded over the wide, flat prairies from Texas to Oregon.

Almost hunted to extinction in the early 1900's, the pronghorn under strict game laws has increased to better than 150,000 animals. Today, on the great, privately-owned rangelands of western Texas, annual antelope hunts are held under game-warden supervision. For each antelope killed, the hunter must pay the ranch owner \$40.

The horns of the prongbuck are unique. They are hollow and braced by bony spikes like other horns, but each horn has a short, dagger-guard offshoot like the antlers of deer. Like deer but unlike any other antelope, the prongbuck's horns are shed each year.

The horns are made of hairs, glued together by a strong cement exuded by the skin on the prongbuck's head. At maturity these horns can measure as long as 20 inches. The prongbuck puts them to good use, for upon his fighting efficiency depends his ability to acquire a mate. He parries and thrusts with them in the finest swordplay of the animal world.

A pronghorn can see a coyote and keep tabs on him so far away that a man must use binoculars to find out what the antelope is looking at. This trait of looking long and hard at a suspicious object gives the American antelope a reputation for curiosity. Actually, it is his best defense.

Once startled, the prongbuck breaks and runs like the wind. His pure-white rump serves as a warning to others at a great distance, as well as providing a guide-flag for fawns to follow.

Often the pronghorn will run for the pure competition offered by a passing train or car. In the early days of the West,

the antelope could win consistently over the wood-burning, clanking old locomotives. Whole herds would run parallel to the train, edging closer and closer. Then

in a terrific burst of speed they would cross in front of the engine, waving their white flags in derision at the engineer.

Science News Letter, August 19, 1950

MEDICINE

Irradiated Plasma Danger

➤ SOME of the blood plasma being collected and stored for use in a possible atomic disaster may actually harm the victims instead of saving them.

If they are suffering from bleeding diseases, as many atomic victims would be, this particular plasma will make them worse because it interferes with the clotting of normal blood.

Warning of this danger is given by Dr. Seymour S. Cutler, Benjamin Burbank and Eugene R. Marzullo, of Long Island College Hospital and Long Island Medical College, Brooklyn, N. Y., in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (July 22).

This plasma may, on the other hand, be useful for patients whose blood has too much clotting tendency, such as those suffering from thrombosis.

The plasma with the anticlotting tendency is that which has been irradiated with ultraviolet light from the Schumann region of the spectrum, with wave lengths from 1,751 to 2,026 angstrom units.

Ultraviolet light is used to sterilize pooled batches of blood plasma. This is done because some plasmas contain the virus of serum jaundice. Irradiation at 2,537 angstrom units did not cause the change in clotting, the Brooklyn scientists found.

The reason for the change in clotting, or coagulability, after irradiation from Schumann region ultraviolet light is not known. The fact that a body fluid, such as blood, is so profoundly altered biochemically by this part of the ultraviolet calls for more investigation, the scientists point out.

Science News Letter, August 19, 1950

AERONAUTICS

Planes Should Have Stall Resistance

➤ ALL new airplanes should be designed so that they will have stall resistance. All present planes should be equipped with mechanical stall warning devices. These are the conclusions just presented to the Civil Aeronautics Administration by a special committee studying stalls, the large number of airplane accidents due to stall and methods of prevention.

Stall is a condition encountered by planes when the speed becomes insufficient to assure proper lift or when a plane is operating at an angle of attack on the air ahead which is greater than the angle of attack of maximum lift. Several warning devices have been developed and their use would save many lives. Stall-proof light planes have been developed.

The study was conducted by the National Research Council under contract with the Civil Aeronautics Administration. It was under the direction of Dr. Philip J. Rulon of Harvard University, an experienced pilot who has made other stall studies for the CAA.

In the study many test runs were made and some 40 flight instructors were interviewed relative to maneuvers to be tested. Seven methods of recovering from a straight-ahead, climbing-power stall were evaluated. Also evaluated were 14 methods of recovering from a straight-ahead, cruising-power stall.

The report of the committee, as well as reports of three earlier studies, are available from the CAA. These four studies represent a major contribution to the safety of flying, according to D. W. Rentzell, Administrator of Civil Aeronautics. The CAA can now assist the industry in eliminating, or at least greatly curtailing, the accidents due to stalls in all types of planes, he said. The first stall-proof light plane originated in a CAA development program in 1934, he added.

Science News Letter, August 19, 1950

ENTOMOLOGY-BOTANY

Farmers Battle Nine New Plant Diseases

➤ NINE new plant diseases popped up to plague the U. S. farmer in 1949, the Department of Agriculture reported.

In Kentucky wheat fields, a blight known as *cladosporium herbarum* appeared. It has caused serious losses in Europe. A new leaf blight caused complete infection of three fields of broomcorn in Illinois. Sugar beet mosaic, a virus disease, attacked California clover, and a new mold appeared in clover in Oregon and Washington.

There were 19 instances of plant diseases popping up in states where they had not been found before. In many states, 1949's hot dry weather brought greater than normal losses from plant disease, the Department said.

Science News Letter, August 19, 1950

Books of the Week

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AN ANALYSIS OF CULTURE CHANGE IN THE ACKMEN-LOWRY AREA—John B. Rinaldo—*Chicago Natural History Museum*, approx 13 p, illus, paper, 25 cents. A study of different pottery types and how they were made. Other artifacts are briefly analyzed

ANNUAL REPRINT OF THE REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION With the Comments That Have Appeared in the Journal of the American Medical Association—*Lippincott*, 231 p, illus, \$2.00

ANTIMETABOLITES—D. W. Woolley, Conference Chairman—*New York Academy of Sciences*, approx. 184 p, illus, \$2.75. This is a series of papers resulting from a Conference on Development and Uses of Antimetabolites, held by the section of biology, New York Academy of Sciences, Feb 11-12, 1949.

THE ARMY AIR FORCES IN WORLD WAR II, Vol IV The Pacific Guadalcanal to Saipan, August 1942 to July 1944—Wesley Frank Craven and James Lea Cate, Eds—*University of Chicago Press*, 824 p, illus, \$6.00. Describes air strategy and tactics used in these theaters.

THE EFFECTS OF ATOMIC WEAPONS—Samuel Glasstone, Executive Editor—*Gov't. Printing Office*, 456 p, illus, paper, \$1.25. A handbook on the effects of atomic weapons prepared by the Los Alamos Scientific Laboratory. Such topics as shock from underwater and underground atomic blasts, a description of an atomic explosion, physical damage, incendiary effects, decontamination and effects on personnel are discussed. (See p. 122)

FIRST COURSE IN PROBABILITY AND STATISTICS—J. Neyman—*Holt*, 350 p, illus., \$3.50. An introductory text planned for a one-semester course.

FLAVOR, TEXTURE, COLOR, AND ASCORBIC ACID CONTENT OF HOME-DEHYDRATED VEGETABLES AND FRUITS—Elsie H. Dawson, Esther L. Batchelder and R. Katherine Taube—*Gov't Printing Office*, U. S. Dept. of Ag Tech Bull. No. 997, 66 p, illus, paper, 20 cents

HOW SCIENCE TEACHERS USE BUSINESS-SPONSORED TEACHING AIDS—Advisory Council on Industry-Science Teaching Relations—*National Science Teachers Association*, 36 p, illus, paper, \$1.00. The results of a survey

THE ILLUSTRATIONS FROM THE WORKS OF ANDREAS VESALIUS OF BRUSSELS: With Annotations and Translations, A Discussion of the Plates and Their Background, Authorship and Influence, and A Biographical Sketch of Vesalius—J. B. de C. M. Saunders and Charles D. O'Malley—*World*, 248 p, illus, \$10.00

INTRODUCTION TO ELECTRICITY AND OPTICS—Nathaniel H. Frank—*McGraw-Hill*, 2nd ed., 440 p, illus., \$5.00. A college text brought up-to-date.

LOVE IS NOT ENOUGH. The Treatment of Emotionally Disturbed Children—Bruno Bettelheim—*Free Press*, 386 p, illus., \$4.50. A report on how seriously disturbed children are helped in attaining mental health. A description of the work of the University of Chi-

cago's Sonia Shankman Orthogenic School (See SNL, Aug 12)

ON SETS OF PROBABILITY LAWS AND THEIR LIMIT ELEMENTS—Michel Loeve—*University of California Press*, approx. 34 p., 50 cents.

THE PATHOGENESIS AND PATHOLOGY OF VIRAL DISEASES—John G. Kidd, Ed—*Columbia University Press*, 235 p, illus, \$5.00. Contains some of the latest information in the field of virology or the science of viruses. The third symposium held at the New York Academy of Medicine, by the Section on Microbiology, Dec. 14-15, 1948.

PERCEPTUAL FACTORS IN DELAYED RESPONSE—Joseph H. Handlon, Jr—*University of California Press*, approx 31 p, illus, paper, 50 cents.

THE RISE OF WORDS AND THEIR MEANING—Samuel Reiss—*Philosophical Library*, 301 p, \$3.75. The author traces the development of words in relationship to language, sounds, meanings, basic characters and origins.

SEXUAL FEAR—Edwin W. Hirsch—*Garden City*, 307 p, \$3.00. Reviews the development of sexual fear through the centuries, from ancient Babylonia to modern times

TITANIUM IN STEEL—George F. Comstock, Stephen F. Urban and Morris Cohen—*Putnam*, 320 p, illus, \$7.50. A critical summary of available data on the use of titanium as a deoxidizer, as a carbon- and nitrogen-stabilizing element and as an alloy metal in steel

VOCATIONAL REHABILITATION OF PSYCHIATRIC PATIENTS—Thomas A. C. Rennie, Temple Burling and Luther E. Woodward—*The Commonwealth Fund*, 133 p., 75 cents. Such topics as transition from patient to worker, the need for rehabilitation services, job finding and placement and research needs are discussed.

Science News Letter, August 19, 1950

CHEMISTRY

Household Cleaning Fluid Poisons and Kills

➤ A WARNING to doctors throughout the nation that there are probably many more deaths and cases of poisoning from carbon tetrachloride than are diagnosed is issued in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (July 15).

In 26 cases traced to this chemical in patients at the Staten Island U. S. Marine Hospital, there were eight deaths, Drs. Robert M. Farrier and Richard H. Smith of the U. S. Public Health Service report.

Most of the victims used the carbon tetrachloride for cleaning clothes or other purposes, and most of them were drinking at the time. Use of alcohol seems to increase acute poisoning and also obscure the cause in the patient's mind.

Failure of the kidney to function properly (anuria) is a prime symptom, but because there is a time interval between the ex-

posure and the renal symptoms the patient seldom associates his trouble with the statement of potential hazard in fine print on the carbon tetrachloride bottle

Most cases of carbon tetrachloride nephrosis are now non-industrial, the doctors find. Large industries using the chemical have become aware of its hazards and have applied effective safeguards, but it is purchased by individuals for cleaning purposes and often carelessly used. Physicians should be suspicious that this chemical is involved when they diagnose kidney trouble.

Science News Letter, August 19, 1950

On This Week's Cover

➤ THE U. S. Air Force speedy Stratojet bomber (B-47) is shown in flight, the picture being of the first of the new planes under production at Wichita, Kans., by the Boeing Airplane Company. An experimental model of this plane flew across the continent last year at an average speed of 607.8 miles an hour, making the trip in three hours and 46 minutes

The swept-back wings of the plane, which are in part responsible for its speed, are shown. It is powered by six General Electric jet engines. It can carry 10 tons of bombs and has a take-off gross weight of 185,000 pounds

Science News Letter, August 19, 1950



NEW SPEEDOMAX

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• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., Washington 6, D. C. and ask for Gadget Bulletin 530. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

⚙️ **FISH BOWL** for display purposes has a tubular glass handle stretching over the top from side to side through which small fishes can swim. Atmospheric pressure keeps the water in the handle after it is once filled.

Science News Letter, August 19, 1950

⚙️ **FIRE ESCAPE** for emergency use is a fabric affair which forms a sliding trough when the upper end is raised to a window at the end of a fire truck ladder. The lower end can be moved outward to make a curved sliding chute so that users lose speed before reaching the ground.

Science News Letter, August 19, 1950

⚙️ **REPEATING FLASHTUBE**, a television light source, is a six-inch long tube capable of emitting intense flashes of light, each of very short duration. It is designed for certain types of equipment used in synchronizing its 60 flashes a second with TV's 30 frames per second.

Science News Letter, August 19, 1950

⚙️ **FLAVOR INJECTOR**, shown in the picture, is for use in adding such flavors as onion juice or powdered spices to the inside of a piece of meat before cooking.



It is a high pressure hypodermic syringe, with a point sharp enough so that it is easily jabbed into the meat.

Science News Letter, August 19, 1950

⚙️ **ELECTRIC SANDER** and polisher serves as a vibratory massager for tired muscles after the abrasive paper is removed.

and a cloth pad substituted. It is a small-size tool that fits the hand easily and makes home refinishing of furniture easy.

Science News Letter, August 19, 1950

⚙️ **CUTTING BOARD** for the home dressmaker has a surface marked on a grid pattern with markings every inch in each direction. Fabrics can be pinned to the surface of the board, and can be folded lengthwise, crosswise, or on the bias accurately.

Science News Letter, August 19, 1950

⚙️ **FIRE EXTINGUISHER**—that can be thrown away after use—is a thin-wall metal container with valve head and easily-broken disk release. The container, an Army development, is designed to use trifluorobromomethane as the extinguishing chemical.

Science News Letter, August 19, 1950

⚙️ **WATER FILTER**, attachable to an ordinary faucet, uses certain resins which have the property of removing minerals in solution by the so-called ion-exchange process. It is a convenient and inexpensive device, usable in home or laboratory, to obtain mineral-free water.

Science News Letter, August 19, 1950

Do You Know?

The Pakistan Government, Asia, is importing cocoons to boost a silk-production industry on a cottage basis.

Only one of the former famous "whale-back ships" developed particularly to carry ore on the Great Lakes is now in existence; 41 of these long cigar-shaped vessels were built between 1888 and 1896, and none since.

When a heifer and a bull calf are born together as twins, the heifer is usually sterile.

The three principal raw materials used in steel making are iron ore, coal and limestone.

The least popular smell, a scientist states, is the skunk-and-rubber combination used as a warning odor in cooking gas.

Trachoma, a widely-spread contagious eye infection caused by a virus-like organism, has been brought within reach of control by use of the antibiotic drug aureomycin.

Eggs laid in the summer have thinner shells than winter eggs.

Meat tenderness increases from three to 15 days after slaughter, recent studies show.

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SCIENCE NEWS LETTER



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BUREAU OF PLANT INDUSTRY
WASHINGTON, D. C.



Solution to Schistosomiasis

See Page 131

A SCIENCE SERVICE PUBLICATION

A YEAR

VOL. 58 NO. 9 PAGES 129-144



Compact industrial television system—developed at RCA Laboratories—lets us see the unseeable in safety!

Eye-witness reports from a fiery furnace!

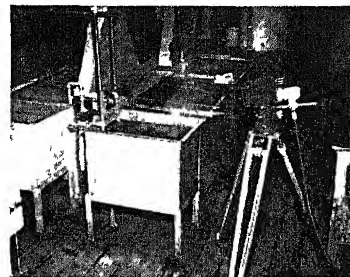
Something's gone wrong in a big blast furnace, and heat is too high for engineers to approach. Focus the Vidicon camera of an RCA Industrial Television System on the flames and the fiery furnace can be studied in comfort on a television receiver.

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See the latest wonders of radio, television, and electronics in action at RCA Exhibition Hall, 36 West 49th St., N. Y. Admission is free. Radio Corporation of America, Radio City, New York.



Here's RCA's Vidicon system at work beside a steaming vat. Note how the television camera is getting a safe "close-up" of the action.



RADIO CORPORATION of AMERICA

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PUBLIC HEALTH

Weapon against Snails

Chemicals are discovered that may conquer schistosomiasis, number three health problem of world, by wiping out snail hosts of fluke parasite.

See Front Cover

► CHEMICALS that may conquer the world's Number Three health problem have been discovered by scientists of the U. S. Public Health Service's National Institutes of Health in Bethesda, Md.

The chemicals are snail-killers. They may stop schistosomiasis, a disease that attacked nearly 2,000 of our fighting men during the invasion of Leyte in World War II. Our forces in Korea now may be in danger of getting this snail-spread disease, though exact information on this is lacking.

Schistosomiasis is caused by a kind of flat, leaf-shaped worm called a fluke. The fluke spends part of its life cycle in the body of certain fresh water snails. Humans who bathe, drink, wade or do laundry in water containing these snails or the larval form of the flukes are likely to get the disease. The flukes produce their eggs in the human body. These get back into the water either directly from humans using the water or via drainage from land fertilized with human night soil.

The cycle can be broken and the spread of the disease stopped by getting rid of the snails. The chemicals that show promise of doing this are sodium pentachlorophenate and copper pentachlorophenate. They have been used in the textile and wood industries and elsewhere. Their snail-killing power was discovered in World War II-sparked studies at the National Institutes of Health.

Excellent results with them in field trials in swamps, lily ponds, roadside ditches and backwash river waters in Puerto Rico are now announced by Drs. Elmer G. Berry and M. O. Nolan of the U. S. National Institutes of Health and Dr. J. Oliver Gonzalez of the School of Tropical Medicine at San Juan, P. R. Dead snails on lily ponds after spraying are shown on this week's cover of SCIENCE NEWS LETTER.

Four other chemicals proved effective in the field trials, but their present price makes them impractical for this use. The two most promising ones cost about 20 cents a pound. Even shipping charges half way across the world will not bring this up much. Copper sulfate, the chemical previously used in the fight against schistosomiasis, costs 22 cents a pound delivered in Egypt.

Copper sulfate has to be applied to snail and fluke-infested waters every two or three months. Even then it does not give very good results. The two phenate chemicals probably will have to be applied only once or twice a year.

To determine just how often they must

be used and how often infected snails come back to the treated waters, Dr. Berry is going to Liberia to conduct more field trials.

Further tests of the safety of the chemicals will also be made. They kill catfish, guppies and eels, but not crayfish, the Puerto Rico trials showed. So far as now known, the chemicals will not harm humans or cattle drinking or bathing in the water. Further tests with rats and guinea pigs in the laboratory are now under way.

Schistosomiasis is the world's number three health problem, coming after malaria and tuberculosis, for two reasons, Dr. Wilford H. Wright, head of the tropical diseases division of the U. S. National Institutes of Health, explained.

One is the number of persons affected, estimated at 115,000,000 persons throughout the world. In Egypt 75% to 80% of the population are infected and the disease is estimated to reduce the economy and production of the country by one-third.

Second reason is that the disease is a chronic one which makes its victims too sick and weak to work. And there is no good remedy for it. Tartar emetic, an antimony compound, is fairly effective when

given early in the disease to patients who can be protected from reinfection. But this is practically impossible for large numbers of people in Egypt, the Orient and some South American countries who have no sewage and water supply systems and must use ponds and streams for everything from drinking to laundry and irrigation.

Patients may be sick with the disease for anywhere from three months to more than two years and eventually die of it. Symptoms may vary from itching of the skin where the fluke larvae enter to fever and severe generalized pain. The eggs of the flukes are often deposited in the bladder and become the nuclei for the formation of bladder stones. Cancer of the bladder is believed also to result from this disease.

Science News Letter, August 26, 1950

PSYCHOLOGY

Homing Pigeon's Rival: Bermuda Lobster

► THE HOMING pigeon's latest rival is the Bermuda spiny lobster.

That lobsters are fully "aware" of their location and can return to their original feeding grounds when released elsewhere was discovered by Dr. Edwin P. Creaser and Dr. Dorothy Travis when they were at the Bermuda Biological Station.

They recovered about 20% of the lobsters released at various sites. This indicates, they conclude in the journal SCIENCE (Aug. 11), that they are probably dealing with a remarkable homing instinct.

Science News Letter, August 26, 1950



TESTING—To find out how much chemical to apply to kill the snails in this stream in Big Creek, Los Pena, Puerto Rico, Dr. Elmer G. Berry is testing the current.

Record Quake in Assam

➤ ONE of the "greatest earthquakes in history," possibly causing considerable loss of life, occurred in the same region where, in 1897, the strongest earthquake ever reported also occurred.

This is the region of the northern Burma, China and Assam province border, made famous during World War II by the Burma Road. The epicenter of the earthquake has been set at 28 degrees north latitude and 97 degrees east longitude, the Coast and Geodetic Survey reported and is accurate within one degree.

Exact number of lives lost and amount of damage caused is still to be determined because of communications difficulties from that area. It may take weeks to learn the full extent of damage.

The earthquake was scaled at a magnitude of 8.4. Top of the scale, based on the worst earthquakes of the past, is 8.5. The 1897 quake occurred before instruments were used to record magnitudes, but seismologists credit it with being the strongest on the basis of reports at that time.

The explanation of why we have earthquakes is relatively simple, but predicting when and where they will strike cannot be done with any accuracy.

The solid, rocky crust of the earth is always in a state of strain and is acted upon by shifting forces. When the rocks shift a little to relieve the strain, they cause an earthquake. The waves set up by this earthquake in the rocky material of the earth spread out like ripples from a stone in a pond and are detected on delicately balanced seismographs half way round the world.

Science Service helped to locate this earthquake by passing coded telegraphed

information from the many institutions that record information on their seismographs to the Coast and Geodetic Survey in Washington, D. C., for computation of the quake's epicenter.

Science News Letter, August 26, 1950

METALLURGY

Slag-Fuming Recovers Metal from Smelter Waste

➤ RECOVERY of strategic metals, such as lead and zinc, from waste piles at smelters by a wartime process known as slag fuming is proving a success and a third installation is now being made.

The waste piles are the heaps of slag from ore-bearing rock, the material that remains after ordinary smelting operation has been carried as far as economically possible. This slag, or tailings as it is sometimes called, still contains considerable metal and salvage of the metal is particularly important where known deposits of the ore are becoming depleted.

The fuming operation, as described by D. V. Sherban of the Babcock and Wilcox Company, is a process in which zinc or lead, in the form of vapor or fumes, is boiled or "fumed" up from the surface of a furnace-load of molten slag. The vapor is converted into a metallic oxide which is cooled as a solid, or as a powder known as "fume," for further processing into finished metal.

Three installations for slag-fuming have been made in North America, Mr. Sherban states. His firm has worked closely with the smelting industry in developing and manufacturing the equipment for this purpose.

The first was made in 1943 at Kellogg,

Idaho, by the Bunker Hill and Sullivan Mining Company. The second was made in Texas at El Paso for the American Smelting and Refining Company and went into operation about two years ago.

The latest installation is near the Arctic Circle at Flin Flon, Manitoba, where the Hudson Bay Mining and Smelting Company has an 800,000-ton accumulation of residue estimated to contain 26% of zinc alone.

Science News Letter, August 26, 1950

SCIENCE NEWS LETTER

VOL. 58 AUGUST 26, 1950 No. 9

43,600 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W. Washington 6, D. C., North 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50, 2 yrs., \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STAt 4439.

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POPULATION

Squeeze on Work Ages

At one end of age scale there is pressure from oldsters who now number 13 for every 100 between 20 and 64. At other end are nation's war and postwar babies.

➤ FOR the next 10 years or so the people of this nation who are at the main working ages, 20 to 65, will be having the squeeze put on them

At one end they are confronted with the rapidly growing number of oldsters in our population. There are 13 people over 65 for every 100 between the ages of 20 and 64. Authorities from all over the land conferred on this problem at the recent Conference on Aging in Washington, D. C.

At the other end is coming the squeeze from the nation's war and postwar babies. Right now there are about 54 children under age 18 for every 100 persons between 20 and 64. That is half the ratio it was 100 years ago when we had 107 children under age 18 to every 100 between ages 20 and 64.

But the downward trend in ratio of children to the population at the main working ages has been reversed.

Due to the war and postwar spurt in the birth rate, the child population has increased at a more rapid rate than people at

ages 20 to 64. This will continue for at least a decade even if allowance is made for a steady decline in the birth rate from its present level and at the same time the population at the older ages continues its long-term upward climb.

One way the squeeze could be at least partly eased received the attention of the delegates to the Conference on Aging. This is to make better use of many of the oldsters who ordinarily retired at age 65. During the manpower shortage of World War II, many men and women over 65 went back to jobs they had given up to younger persons. Some of them had physical handicaps, but that did not keep them from doing a job.

If the present manpower situation becomes acute, many of them may go on working or return to work regardless of being over age 65.

To keep the oldsters healthy was another of the problems engaging attention from some of the delegates. Our medical men for many years concentrated on keeping babies

alive and keeping children well. More and more of them now, in research laboratories and in office and clinic, are working to keep old people healthy and active. The increasing numbers of youngsters may give the push needed to keep the older persons working for more years. And for many of them this in itself will be a health measure.

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PSYCHOLOGY

Thyroid May Control Ability to Taste

➤ YOUR ability to taste may have some connection with how your thyroid, the U-shaped gland in the neck, functions

This suggestion comes from Dr. William C. Boyd of U. S. Naval Medical Research Unit No. 3 in Cairo, Egypt. He bases it on taste tests with an anti-thyroid chemical, 1,5-vinyl-2-thioxazolidone. The chemical is related to the more familiar anti-thyroid drugs, thiourea and thiouracil. It has only recently been isolated and occurs widely in nature, especially in turnips and cabbage.

Tests were made of the antithyroid chemical on 21 persons. They had previously been tested for ability to taste PTC, or phenylthiocarbamide. About 25% of most populations cannot taste PTC at all, while the others find it quite bitter.

The persons in Dr. Boyd's study who could taste PTC could all taste the anti-thyroid drug, while those who could not taste PTC also could not taste the anti-thyroid chemical.

PTC is a synthetic chemical. Ability to taste it is hereditary. How and why there should be in some persons a gene giving ability to taste a compound which does not occur in nature is hard to understand, Dr. Boyd points out (SCIENCE, Aug. 4). The connection with thyroid function seems to give a clue to the reasons.

Science News Letter, August 26, 1950

PSYCHOLOGY

Ping-pong Ball Goggles In Vision Experiment

➤ GOGGLES made from the two halves of a ping pong ball are creating an artificial world of fog for those taking part in vision experiments in the psychology laboratory at Cornell University in Ithaca, N. Y.

Looking through the ping pong goggles, the subject can see brightness or darkness but he can not perceive the texture of surfaces. It is as though he were enveloped in a fog.

Dr. James J. Gibson, professor of psychology at Cornell, is using this device to test his new theory of how we perceive depth. He believes our perception of depth and distance is due to our manner of seeing textures or surfaces of objects. The experiments are being conducted for the U. S. Air Force.

Science News Letter, August 26, 1950



SEEING IN A FOG—Wearing goggles made from ping-pong balls, research assistant Walter L. Carel, of Cornell University, is discovering what vision is like when brightness and darkness can be perceived but not the texture of surfaces. Dickens Waddell is acting as observer.

NUTRITION

From Now On: Vitamins

Food factors such as B₁₂ promise to not only bring better health to the sick but also to help farmers grow more meat faster and cheaper.

By WATSON DAVIS

Twenty-second in a series of glances forward in science.

➤ IS it more wonderful to rescue those dying of pernicious anemia or to give the farmer a means of growing more meat faster and cheaper in order to feed more people?

One of the latest vitamins, twelfth in the B series, does both—and more.

In 1926 one of the great discoveries in medicine was made by Minot, Murphy and Whipple—made Nobelists for their achievement—that eating of liver relieves the symptoms of this blood disease. The effective chemical in the liver, or at least one of them, turned out to be a red crystalline material, which was called vitamin B₁₂. It is, on a weight basis, we are assured, the most potent therapeutic compound known to medicine.

The conquest of any human disease, even in these days of many such achievements, is notable. But the possibilities of the use of this B₁₂ substance in raising food are even more exciting commercially and agriculturally.

For putting weight on hogs and making chickens grow and produce eggs, some food of animal origin, such as fish meal, skim milk, etc., has long been known to be desirable. It contains what is called APF, or animal protein factor. The vitamin B₁₂ seems to substitute for APF to a large extent and it is being used in animal feeding, converting an all-vegetable diet into the equivalent of the one that contains animal proteins.

The same microorganism that produces streptomycin, one of the four most successful antibiotic disease fighters, can be made to yield B₁₂ as the result of fermentation. Thus the supply of the vitamin is no longer dependent upon animal production.

Even little children who are under par in school ask for second helpings and improve in vigor, alertness and general behavior when fed very small amounts of B₁₂. It may put weight on our population as well as provide more food for our youngsters to eat.

In the intensive search for things to give a growth kick to animals being raised on our farms, it was discovered just a few months ago that one of the other new medical antibiotics, aureomycin, can team up with B₁₂ in the feed to give a cheaper protein supplement. Aureomycin and B₁₂ used together make the pigs and chicks grow even faster than B₁₂ alone.

Even more recently a third compound, a derivative of arsonic acid, was discovered by the U S Department of Agriculture to give an additional impetus to growth.

What happens in animals is likely to apply equally well to human beings. These newer supplements can be expected to affect human medicine and well-being as well.

Such complex and involved developments in nutrition as the recent history of B₁₂ and related substances assures us that there is still much more to be learned about the food we eat and give our animals.

In the future, we may expect:

A Additional food factors perhaps in the B vitamin family will be discovered, with the consequence that diseases will be countered and nutrition will be improved.

B. Parts of the world where foods of animal origin are scarce and costly will benefit in the near future from these newly discovered factors in food, just as the longer recognized A, D, C and B₁ vitamins have vastly improved the fare of millions.

C In our own agricultural economy, more high-grade protein food production, such as meat, will be possible in the near future through use of soybeans, cottonseed meal, and wheat middlings supplemented by B₁₂ and similar non-animal factors.

Science News Letter, August 26, 1950

ENGINEERING

Coal Gains in Electric Field, Loses in Others

➤ COAL, which has lost ground to fluid fuels in many heating and power jobs, has been growing in importance yearly in the electric power utilities.

This field represents the form by which coal can best compete with the fluid fuels, according to Bertrand A. Landry of Battelle Memorial Institute, Columbus, Ohio.

How coal is losing out in other fields to liquid fuels and natural gas was pointed out by him at the Annual Midwest Power Conference held by the Illinois Institute of Technology. Among other matters he discussed necessary steps to improve coal's position.

Reasons for the decline in coal's relative position were given by him as its increasing price, the greater convenience of fluid fuels, the interruptions to day-to-day supplies due to strikes, and the rising standards with regard to air pollution.

The questions of convenience and of air pollution can be met in part at least. Re-

search and development have shown, in recent years, that substantial improvement over conventional methods of handling and of burning coal and of disposing of ashes could be achieved, he stated.

Research and development over the last 10 years, he added, has established that domestic equipment can be designed and manufactured in which coal can be burned nearly smokelessly for domestic heating. The application of overfire air jets to boiler furnaces has also been studied and rationalized.

Coal seems to be the preferred fuel in the electric power utilities, he indicated. The total consumption for electricity is now twice what it was in 1939, he declared. Over 40,000,000 tons more coal is now being required yearly to meet this increase. Greatly added tonnage will be needed for electric plants under construction and for other plants that will be required in the future to satisfy the increasing demands for electricity.

"It is, therefore, definitely to coal's advantage to promote the use of electricity in all its varied applications," he asserted. These applications stretch from running giant electric motors to minor household gadgets, and might include clearing sidewalks of snow and ice.

Science News Letter, August 26, 1950

PHYSICS

Atomic Cloud Height Figured from Cumulus Data

➤ HOW high an atomic cloud will rise can be figured from data applicable to any ordinary, much less dangerous cumulus cloud. By doing this, Dr. Lester Machta of the U S Weather Bureau has figured that the original Los Alamos atomic cloud rose 39,800 feet.

A cloud rises because it is warmer than the surrounding air and it stops rising because it cools, both by expansion and by the entrance of outside air into the cloud.

An atomic cloud does a super cooling job. It starts out at least 1,000,000 degrees centigrade and almost instantly cools down to about 3,000 degrees centigrade, by radiation. Then the usual meteorological effects take over.

The heat of the cloud brings in tremendous amounts of air and at the same time the cloud expands. As this is going on, the cloud rises, getting to 30,000 feet in about eight minutes.

By that time it is almost as cool as the surrounding air and shortly thereafter, when its temperature equals the surrounding air, it stops.

Dr. Machta, in the BULLETIN OF THE AMERICAN METEOROLOGICAL SOCIETY (June), has figured out the height to which an atomic cloud would rise, using mathematical formulae based on the cooling rate of an ordinary cloud.

Science News Letter, August 26, 1950

INVENTION

Inventors Aid Government

Electronic experts are tackling the problem of preventing jamming of Voice of America broadcasts. Top problems are listed by National Inventors Council.

► INVENTORS of the nation are rushing to help solve the problems of rebuilding America's war machine, as they did during World War II.

The first big job that has been tackled in the last few months under the stimulus of the National Inventors Council is countering the jamming of the Voice of America broadcasts by the Soviets.

More than 60 top electronic experts have been working for the past six months on this situation at the joint request of the Department of State and the National Inventors Council. Details of progress have not been announced, but as a result the American radio messages should soon be getting through to the Russian people with more reliability.

The Korean situation has doubled the number of suggestions being received at the Department of Commerce by the National Inventors Council, headed by Dr. Charles F. Kettering, General Motors consultant. At present, ideas and inventive suggestions are being received at the rate of 8,000 a year. During World War II a total of 250,000 were received and evaluated by this voluntary but official committee of leading engineers and scientists.

The National Inventors Council is an open door for inventors who wish to present ideas to help the war effort. In addition, the Council issues on behalf of the armed services technical problems for which solutions are needed.

Among the new problems issued are:

A tool for the rapid splicing of military field wire, under adverse weather conditions and darkness.

A light-weight gasoline vehicle that can operate over snow.

Machinery for fabricating and welding titanium.

An adhesive that can stick explosive to a vertical surface for two months even when as cold as 40 degrees below zero.

An automatically coupling joint for bridges.

Foam that can be produced in the field to fill canvas tubes for buoyant floats.

Methods for discharging ships rapidly on the beach or dock.

A substitute for down and feathers for use in arctic sleeping bags.

Machinery for burrowing a large tunnel through packed snow or ice.

A personal heating system.

Practical method of destroying tell-tale tracks of men or vehicles over snowfields.

A way of transporting supplies over glaciers.

A way of making snow, bogs, marshes, ponds and frozen soil solid for use as roads, airfields, etc.

Inexpensive method of rapidly turning snow and ice into drinking water.

Rubber and other materials that keep their usefulness at temperatures from 65 degrees below zero to 160 degrees above.

Device for protection of head and nose against extreme cold.

Science News Letter, August 26, 1950

AGRICULTURE

Cobalt Speeds Up Hog Fattening

► COBALT, the mystery mineral of better nutrition, has been shown in Fargo, N. D., to produce the same speed-up in the fattening of hogs as has been found in sheep and cattle.

Significant because swine have a different stomach system from ruminant animals such as cows and sheep, experiments by four scientists at North Dakota Agricultural College have furnished a new link between cobalt and vitamin B-12 and new evidence in the stepped-up study of the so-called "trace elements" in the food which animals—and humans—eat.

Pigs fed tiny amounts of cobalt in carefully-controlled diets put on more weight, and put it on faster, than pigs not having the added mineral, Drs. Earle W. Kloster-

man, W. E. Dinusson, Earl L. Lasley, and M. L. Buchanan report in the journal, SCIENCE (Aug. 11).

Science News Letter, August 26, 1950

PSYCHOLOGY

Device Tests Afterimages Even in Children

► IF YOU look fixedly at a bright colored object, for some time afterwards you may see a shadowy image of the object in contrasting color, known to psychologists as a negative afterimage.

To observe these afterimages scientifically and report their appearance and disappearance has required a good deal of intelligence, reliability and special training.

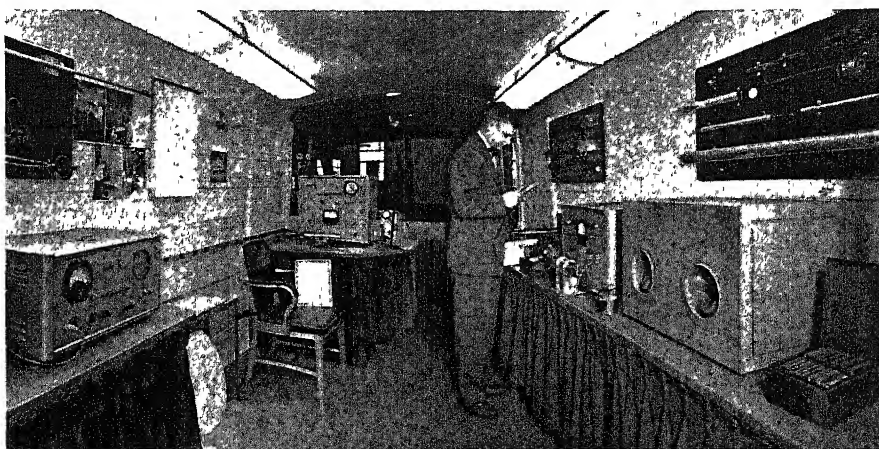
Now a device has been invented to test for afterimages so simply and objectively that it can be used even with children or mentally disturbed patients, Dr. H. Lehmann, of Verdun Protestant Hospital, Montreal, Can., reports (SCIENCE, Aug. 18).

The person seeing the afterimage is not even aware of seeing the original colored object that produces the afterimage, Dr. Lehmann says.

The device is a disk, half white and half black with a pie-shaped piece cut out of the black section. When this is spun rapidly in front of a red circle, the rotating disk will appear to the observer to be green. Because of the spinning he will not see the black or white separately, and neither will he be aware of seeing the red circle behind the cut away notch.

By regulating the intensity of the light by polaroid filters, Dr. Lehmann was able to determine at what degree of brightness the afterimage was visible—that is, when the rotating disk appeared green—and at what intensity the observer noticed the original color, red.

Science News Letter, August 26, 1950



FOR ATOMIC BOMB DEFENSE—All the instruments needed to detect and measure radioactivity are mounted in this truck-carried laboratory. In case of explosion, this mobile laboratory could speed to the scene to test for radiation, identify type of rays, and measure danger. It is built by Radiation Counter Laboratories, Inc., of Chicago.

PHYSICS

Atomic Energy Use for Hot Liquid Metals

► A PREVIEW of some of the hottest handleable liquids in the world—some of them metals that become liquid at more than a thousand degrees Fahrenheit—that might be used in atomic energy power plants has been issued by the Atomic Energy Commission and the U.S. Navy.

Some of the metals surveyed in a new liquid metals handbook are familiar ones in solid form: Aluminum, lead, magnesium, tin and zinc. One is usually seen as a liquid: mercury. Others less familiar are: Antimony, bismuth, cadmium, cesium, gallium, indium, lithium, potassium, rubidium, sodium, and thallium.

Now used in carrying heat to kettles in which chemicals are manufactured, reheating steam in power plants, and controlling mold temperatures, liquid metals would be one method of carrying the heat from the atomic reactors to engines where it could be used for power generation.

Science News Letter, August 26, 1950

ENGINEERING

New Subway Cars Have Constant Lighting

► LIGHTING for New York City's newest subway cars and the lighting system installed in the new Brooklyn-Battery traffic tunnel, which connects the city proper with Long Island, were described to the Illuminating Engineering Society meeting in Pasadena, Calif. Both are noteworthy installations.

Fluorescent lighting with the lamps operated on an uninterrupted alternating current, instead of on direct current from the third rail as now done, is the important feature in a new subway train in experimental use. The system employed is a development of Westinghouse Electric Corporation, and its features were described by E. W. Beggs and H. W. Graybrook, of Westinghouse.

Fluorescent lamps were developed for operation on alternating current, they said, and they operate more efficiently on it than on direct current. To obtain the alternating current from the direct current that operates the driving motors of the train, motor-alternators are used in each car.

But gaps in the third rail system that delivers the power to the train presented a difficulty. The track layout of the New York subway requires frequent gaps in the third rail. They provide interruption of the power to each car about 35 times per operating hour.

This difficulty was overcome in the new cars by adding flywheels to the motor-alternators. The inertia of the flywheel provides power to keep the lamps lighted across the longest gaps in the system.

Many features of the lighting system of the Brooklyn-Battery tunnel were described by Leo Geenens of the New York Triborough Tunnel Authority and Kirk M. Reid of General Electric. The lighting system comprises over 36,000 linear feet of luminaires.

To aid the lighting, side walls and ceiling have a white-tile finish and will be kept well washed. Important is a "daylight" entrance lighting that extends 1,800 feet in each tube. From bright lights in the first 400 feet, lighting is scaled downward through the rest of the 1,800 feet to provide easier adjustment of the driver's eyes

Science News Letter, August 26, 1950

WILDLIFE

Drumming's New Method For Counting Grouse

► THE DRUMMING of the ruffed grouse, one of the most unusual sounds in nature, is being used experimentally as a census technique by the North Dakota Game and Fish Department.

In the past, the ruffed grouse census has been taken in the fall of the year by walking several miles in a number of study plot areas and recording the number of birds actually seen.

At present a roadside count method is being tried by driving a mile, stopping four minutes, and recording all drumming heard. The drumming sound can be heard for approximately a half mile and seems to be consistent from before sunrise to one to two hours afterward. So far this new technique has worked out very successfully.

The "drumming" sound for which the ruffed grouse is noted is not vocal but is produced by rapidly whirring wings in the air.

Science News Letter, August 26, 1950

VETERINARY MEDICINE

Pigs with Dished-In Faces Infectious to Other Pigs

► IF your pig has a dished-in face, off to the isolation ward with him. His ailment is infectious.

The peculiar disease which gives pigs this caved-in appearance is known as *atrophic rhinitis*. It causes certain bones in the face to disintegrate. Few pigs die from it, but it retards their fattening. Veterinarians know little about it.

Two Canadians, Drs. F. W. Schofield and T. L. Jones of Guelph, Ontario, say they have proved the disease is catching, however. They have not yet identified the infectious agent, they report in the JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION. But they say that isolation of infected pigs helps control outbreaks.

Science News Letter, August 26, 1950

METEOROLOGY

Most of Nation Warmer Until Mid-September

► EXCEPT for the South Atlantic states and the Pacific Northwest, the country is in for warmer than normal weather until mid-September. The U. S. Weather Bureau's extended forecast says the South Atlantic states will have near normal temperatures and the Pacific Northwest will be slightly below normal.

Those above normal temperatures, at least in the eastern half of the country, will be accompanied by less rain than usual for the mid-August to mid-September period. The below-normal rainfall will extend to the South Atlantic states, too.

Most of Washington, Oregon and New Mexico will enjoy greater than normal rainfall, while the rest of the country will see rainfall in about the usual amounts for the same period.

The long range forecasters add that in most of the area from the plains eastward to the Appalachians, the weather from Aug. 15 to Sept. 15 should be warmer and drier than it was during the previous 30 days.

Science News Letter, August 26, 1950

AVIATION

Improved 'Chute Webbing Makes Jumping Safer

► IMPROVED webbing for parachute harness, developed at the Wright-Patterson Air Force Base, will make jumping safer and will save much money to the government because of the long life of the improved material.

The material is nylon webbing which has been treated with a resin, polyvinylbutyral. The resin does not penetrate the nylon fibers of the webbing, but it acts somewhat like an adhesive to prevent the fibers from separating and the webbing from fraying.

In the treatment process, the ribbon-like strands of nylon webbing strips are dipped into a water solution of the resin, commercially known as Merlon-BR, which has been dispersed in a wetting agent known as Duponal. The strips are then run through rollers similar to those on an ordinary washing machine. Excess water is removed but, more important, the resin is pressed into the webbing.

After drying in an oven, the strips are ready to be stitched into a harness for the parachute. The treated webbing is stiffer than untreated material, but this is a definite advantage in its wearing qualities.

Science News Letter, August 26, 1950

CHEMISTRY

Devices Give Pure Salt-free Water

► PURE salt-free water from the tides of the Hudson River or the industrially contaminated Susquehanna can be drawn in either household quantities or for large-scale factory use by means of devices announced recently by the Rohm and Haas Co. of Philadelphia.

More thorough-going than the type of water softener that keeps scale-forming and bath-tub ring salts in solution, these devices take all dissolved material out of the water supply, by means of a series of artificial resins known as amberlites. Two kinds of resins must be used at the same time. The new development for their use on an industrial scale consists of a separation procedure for renewing their activity when they become clogged. The procedure floats the lighter resin to the top of the container for treatment. Afterward air is forced in to mix the two materials again for use.

For household use the mixture of resinous particles is packed in a plastic tube to be attached to the water faucet, and a color indicator incorporated in the material tells when it is time to discard the water conditioning chemicals and install a new cylinder. A medium-sized installation which will provide pure water for automobile batteries, or for photographic developers, is also offered with a built-in current indicator to keep count of the purity of the treated water.

Science News Letter, August 26, 1950

ENGINEERING

Wheat Pumped Through Pipes like Water

► IN THE BARN of tomorrow, throw a switch and open a valve. Dry grain will come out of pipes like water.

This is the promise of experiments by engineers at West Virginia University. Whole-kernel wheat was substituted for pulverized coal in a compressed air "fluidizer" and blown through tortuous lengths of one-inch piping both efficiently and economically.

Air fluidization is a principle by which powdered coal and other finely-divided solids have long been moved through small pipes.

The same principle now makes conceivable an entire farm piped for push-button feeding of livestock and poultry. Results of initial tests are reported by Dr. Alfred D. Longhouse and D. P. Brown, agricultural engineers, and Dr. Howard P.

Simons and C. W. Albright, chemical engineers, in the technical journal *AGRICULTURAL ENGINEERING*.

Their studies were begun with borrowed coal equipment. Wheat was fed into the top of a tall, narrow cylinder. Compressed air was pumped in at the bottom. Fluidized grain was taken out a discharge pipe at the middle of the chamber.

Using air at only five pounds per square inch above atmospheric pressure, the researchers found that a ton of wheat an hour could be moved through a one-inch pipe 75 feet long. The delivery line had three right-angle corners and a U-turn in it.

Power required by the air compressor was less than three-eighths of one horsepower. By weight, one pound of air moved 20 pounds of grain. Even greater efficiency may be obtained if ground grain is fluidized in the same manner, the engineers say.

Science News Letter, August 26, 1950

PSYCHOLOGY

New Theory of Sense of Smell

► A NEW theory of how the sense of smell works has been developed by Dr. G. B. Kistiakowsky of Harvard University (*SCIENCE*, Aug. 4).

Odors work through enzymes, he believes. Enzymes are a class of chemicals which can produce the transformation of other chemicals. Many vital body processes go on through the mechanism of enzymes. Pepsin, a digestive enzyme, is one familiar example.

You get the odor of a chemical because it changes the concentration of one or more enzymes. The change in enzyme concentration produces a signal in certain nerves. The intensity of a smell is related, according to this theory, to the extent to which the enzymes are checked or blocked in their action.

The persistence of certain odors may be due to a non-reversible change in the blocking of enzymes, though most of the enzyme blocking is reversible.

Science News Letter, August 26, 1950

PHYSICS

Radio-Frequency Circuits Shed Light on Atom

► A NEW use for radio-frequency circuits is to determine the magnetic properties of the atom. Since atomic particles spin and carry electric currents they behave like small magnets.

Dr. Felix Bloch, professor of physics at Stanford University, reports new developments in the study of nuclear magnetism in the journal, *PHYSICS TODAY* (Aug.).

Placing these invisible magnets in an alternating magnetic field gives rise to electric forces which can be measured by short radio waves. New information about the

structure of matter has been discovered by varying the electric and magnetic forces to which atomic magnets respond, and measuring the time necessary for their response.

Science News Letter, August 26, 1950

PSYCHOLOGY

Flicker Frequency Found Related to Intelligence

► INTELLIGENCE may some day be measured by a flickering light instead of with the conventional paper-and-pencil mental tests.

The length of the dark period between flashes of light necessary for you to see the light as flickering and not continuous is determined by your central nervous system and not by your eyes.

New evidence of this is reported by Dr. Wilson P. Tanner, Jr., of the University of Michigan (*SCIENCE*, Aug. 18). He found that this "flicker frequency" is related to scores on intelligence tests. It may be possible in the future to measure ability to see light as flickering, instead of giving a paper-and-pencil test to measure intelligence, Dr. Tanner suggests.

A surprising discovery in the course of the experiment was the fact that the relation with intelligence varies with the length of the light flashes separated by the periods of darkness. It increases with increase in the length of the light flash, up to 84 thousandths of a second, and then decreases with further increase of the length of the light flash.

Science News Letter, August 26, 1950

NUTRITION

Vitamin Lack Kills Hens When They Start Laying

► IT IS not heart trouble that causes the non-infection deaths of hens about the time they start laying, but this loss to poultrymen may be linked to a deficiency of vitamin B₁ or potassium.

After a whole year of taking electrocardiograms of hens, which involved working out new methods, Dr. Paul David Sturkie, Rutgers professor of poultry physiology, found that heart ills killed only about 2½% of the normal hens, compared with about 25% deaths from unknown causes.

In another study, artificial diets lacking in vitamin B₁ and potassium did produce heart abnormalities in hens. Lack of vitamins A, D and G did not affect the heart, while too much potassium did.

Prof. Sturkie is now beginning a study of the blood pressure of hens as the next step toward solving the cause of this major loss in the poultry industry. Since the pulse rate of chickens is 300 to 400 a minute, too fast to count, electronic counting methods had to be developed.

Science News Letter, August 26, 1950

ASTRONOMY

Total Moon Eclipse

For nearly an hour, on Sept. 25, our satellite will be completely eclipsed by earth's shadow. The moon will shine with a dull red glow.

By JAMES STOKLEY

► THE GIANT JUPITER, largest member of the family of bodies, including the earth, that revolves about the sun, is the only planet visible during the month of September throughout the evening. The month is not without its attractions, however, for there is a total eclipse of the moon coming on Monday evening, Sept. 25. For nearly an hour our satellite will be immersed in the earth's shadow, shining with the curious coppery-red color characteristic of such an event.

Earlier on September evenings it will be possible to get a glimpse of the planet Mars in the constellation of Libra, the scales, low in the southwest as darkness falls. Mars sets about two and a quarter hours after the sun. It is about as bright as an average first magnitude star, but being so low when it appears, it is fainter than normal.

Jupiter, on the other hand, rises in the east about the same time that the sun is going down. It is therefore visible throughout the night. Its position in the constellation of Aquarius, the water-carrier, is shown on the accompanying maps. These depict the sky as it looks around 10:00 p. m. at the first of September, an hour earlier in the middle and two hours earlier at the end. (Add one hour if you are on daylight time.)

Vega Brightest

Turning to the stars which are self-luminous suns, quite different from the planets which shine by the light they reflect from our sun, we find that Vega, in Lyra, the lyre, is brightest. This shines high in the west. Not far from it and directly overhead at the times for which these maps are drawn, we see Cygnus, the swan. In this is the bright star Deneb, at the top of a group sometimes called the northern cross. The bottom of the cross points toward the southwest. Just below the star at the lower end, called Albireo, there is another of the first magnitude—Altair, in the figure of the Aquila, the eagle.

Our other stars of the first magnitude, besides Vega, Altair and Deneb, are all low in the sky. Capella, in Auriga, the charioteer, is shown near the northeastern horizon, a harbinger of winter. Later in the night, as in the evenings of winter, it will climb high overhead. On the other hand, Arcturus, in Bootes, the bear-driver, is near the northwestern horizon, about to vanish for a while after having been promi-

nent in the evening skies of spring and early summer.

Low in the south we find the constellation of Piscis Austrinus, the southern fish. As shown in the imaginative pictures of the old star maps, it is represented as swallowing a stream of water falling from a jar being emptied by an old man in Aquarius, the water-carrier, just above. The southern fish contains the bright star Fomalhaut which will be seen in the evenings of the next few months, never rising much higher than it is now.

Mercury Seen

At the very end of September, it may be possible to see Mercury, innermost of the planets, low in the southeastern sky just before sunrise. It will be seen best in this position in early October, for on the second it will rise farthest ahead of the sun. Early in September Venus, much more brilliant, may be seen in the same time and place. It is drawing near the sun, passing Mercury on the 23rd, by which time it will hardly be visible.

Also on the 23rd, at 9:44 a. m., EST, the sun, which has been journeying southward through the sky since June 21, will be directly over the equator. This is the autumnal equinox which, for us, marks the beginning of autumn. For countries south of the equator, it is the beginning of spring.

Approximately every 27 1/3 days the moon makes a complete revolution about the earth in a period called the sidereal month. That means it comes back to the same direction among the far distant stars in the background. However, the time between successive full moons, or between

the recurrence of any particular phase, is a little longer. Actually it is about 29 1/2 days and is called the synodic month.

Reason for the difference in the two kinds of months is found in the earth's own movement, once a year, about the sun. As our direction from the sun changes, its direction from us likewise changes. Thus it seems to travel around the sky, from west to east, once every year.

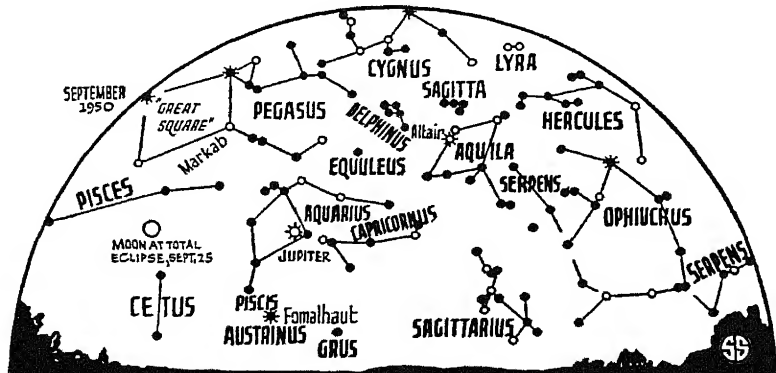
The phase of the moon depends on how nearly it is in the same direction in the sky as the sun. When the two bodies are nearly in the same direction, the moon is new, when they are in opposite directions, the entire sunlit half is turned toward us and we see a full moon. When it is a quarter of the way around the sky from the sun, either to east or west, we see just half of the illuminated hemisphere—or a quarter of the complete moon—and we have the phase of first or last quarter.

Both moon and earth, being solid spheres, cast shadows out into space, though generally they are not apparent. If the plane in which the moon revolves around the earth coincided exactly with that in which our planet travels about the sun, then every time the moon was new its shadow would fall upon the earth, and from the part of our planet where the moon passed in front of the sun there would be a total eclipse of the sun. Similarly, at full moon, our satellite would be entirely in the earth's shadow and there would be a total lunar eclipse.

Shadow Misses Earth

Since the plane of the moon's orbit does not coincide with that of the earth's, but is inclined to it by about five degrees, at most new moons the lunar shadow misses the earth. Similarly, at full moon that body generally passes either north or south of the terrestrial shadow.

Occasionally, however, it happens that the moon is full when it passes through the



◀ EAST

Face South

WEST ▶

☆ * ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



earth's orbital plane, and then it does go into our shadow. This will happen on Monday evening, Sept 25, at the time of the "Harvest Moon," producing a total eclipse visible over practically the whole of the Western Hemisphere

There are two parts to such a shadow. The inner core, called the umbra, is the true shadow, where the light of the sun is completely obscured. Around this is a region of partial shadow, called the penumbra, from which an observer would see the dark earth partly covering the disk of the sun.

On Sept 25, at 8 20 p. m., EST, the moon enters the penumbra, but at first so little sunlight is cut off that no noticeable effect will be observed. An hour later, however, the eastern edge of the lunar disk will be noticeably dimmed. At 9:31 this edge makes its first contact with the umbra, as shown at I in the diagram. More than an hour will elapse while the moon catches up with the shadow, which is also moving through the sky toward the east. Then, at 10 54, the moon will be at II, totally eclipsed, remaining so until position III is reached, at 11:40 p. m. At mid-eclipse (11.17) the moon will be at the position indicated on the map, in Pisces, the fishes

Will Not Disappear

Although in total eclipse, the moon will not disappear from view but will continue to glow with a dull, coppery-red color. Despite the fact that the earth's globe completely eliminates the direct solar rays, some of these are bent by the prismatic action of the terrestrial atmosphere, so that they illuminate the totally eclipsed moon. As sunlight penetrates the atmosphere, some of the blue rays are scattered, to give the daytime sky its blue color. Similarly, at the time of a total lunar eclipse, some light from the sun filters through the earth's atmosphere around the base of the shadow, and is refracted and diffused into the shadow and onto the moon. The red predominates in this light, the same effect that makes the sun look red when it is setting.

If a passenger on a rocket ship had reached the moon in time to be there when a total lunar eclipse happened, he would

be able to see the earth itself totally eclipsing the sun. Around the dark disk of the earth he would see the atmosphere as a brilliant ring of red, an effect that has been reproduced on several occasions in the planetaria of New York, Philadelphia and other cities when they have presented their "Trip to the Moon" show.

After the total eclipse ends, at 11:40 p. m., EST, the northern edge of the moon starts to emerge from the umbra. Again, as during the first partial phases, the curved edge of the shadow of our globe may be seen on the lunar disk. The eclipse ends at 1 02 a. m., Sept. 26, with position IV. For a time the moon will still be noticeably dimmed, until 2:14 a. m., when it is completely clear even from the penumbra, and shines with undiminished brilliance.

This is not the month's only eclipse, though it well might be, for all that most of us will be able to see. Two weeks earlier, on Sept. 11, as the moon is new, its shadow will fall across the earth, tracing out a path from which a total solar eclipse will be visible. It passes close to the North Pole,

across northeastern Siberia, the Aleutian Islands, and ends in the northern Pacific. The sun will be partially eclipsed as seen from northern Asia, including Siberia, China, Korea and Japan, Alaska and a large part of the Pacific Ocean.

Time Table for September

Sept.	EST	
3	5 00 a. m.	Moon farthest distance 251,300 miles
4	8 53 a. m.	Moon in last quarter
10	2 40 p. m.	Moon passes Venus
11	10 29 p. m.	New moon (total eclipse of sun, visible from Asia and N. Pacific)
12	5 21 a. m.	Moon passes Saturn
	2 00 a. m.	Moon nearest, distance 227,500 miles
	10 00 p. m.	Saturn in line with sun
	12 13 p. m.	Moon passes Mars
	3 00 a. m.	Mercury in line with sun
	3 54 p. m.	Moon in first quarter
	7 37 a. m.	Moon passes Jupiter
	9 44 a. m.	Sun crosses equator, autumn begins in Northern Hemisphere
	10 00 p. m.	Mercury passes Venus
25	11 21 p. m.	Full moon (Harvest Moon), moon totally eclipsed
30	11 00 p. m.	Moon farthest, distance 251,800 miles

Subtract one hour for CST, two hours for MST, and three for PST

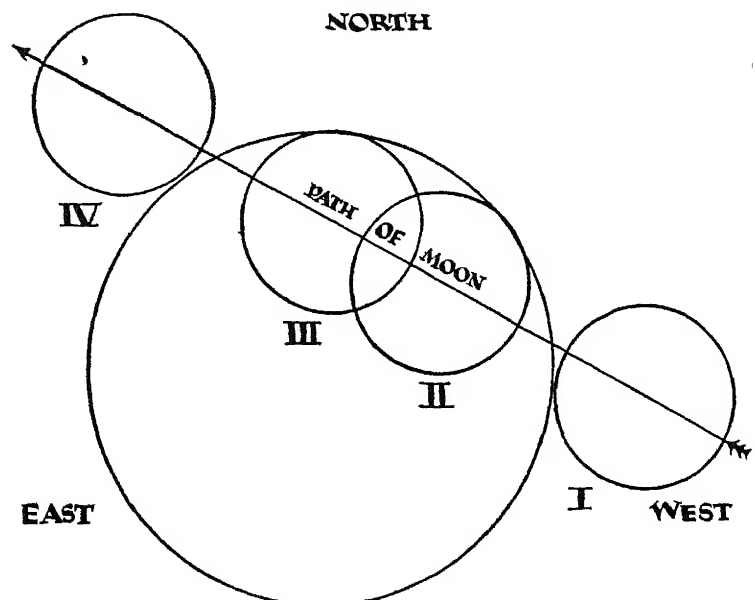
Science News Letter, August 26, 1950

ZOOLOGY

Tuco-Tuco and Armadillo Unusual Zoo Specimens

➤ LATEST Washington arrivals from Paraguay—at the zoo in Washington, D. C.—are the first specimens to reach there of a little rodent called tuco-tuco, about the size of our ordinary rat, and the three-banded armadillo, about four to five inches long.

Science News Letter, August 26, 1950



PSYCHOLOGY

Special Sights for Dusk

► THE GI crawling through the underbrush to make a dawn attack should have special sights on his rifle to help him get a bead on his enemy.

This is the conclusion of Dr. C. J. Warden, Columbia University psychologist, as a result of experiments on marksmanship with various kinds of sights in dim illumination.

The Springfield or notch type of sight should be abandoned, Dr. Warden recommends. The aperture or ring type of rear sight used on the Garand rifle is far superior under all kinds of light, he found.

But the ring should be larger for dim light as the pupil of the eye expands. The best size is about half the size of the pupil of the eye.

In the Garand sight, a blade mounted near the end of the rifle is lined up with the target and the rifle held so that it is centered in a ring mounted fairly close to your eye. In the Springfield type the blade lined up with the target is centered over a notch in rear sight.

For dim illumination, the blade of the front sight should be bright colored—white, gold, or yellow—and not black as in the regulation rifle. The colors should be dull, however, to prevent glare.

All military rifles should carry two sets

of sights, urges Dr. Warden. They should be mounted so that a flick of the mechanism will turn the right sight into place and the other will be on the reverse side of the barrel out of view.

Aside from permitting greater accuracy, the sights recommended by Dr. Warden cut down on the time required to aim, the difference being as much as two and a half seconds per shot.

Girls taking part in Dr. Warden's experiment developed just as great speed and accuracy in firing as did the men tested.

Some 23 of the 33 persons who took part in the experiment had experience with shooting, ranging from two hours of hunting to boot training in the Navy or basic training in the infantry. This group made slightly better scores in the experiments than did the inexperienced, but the difference was not large enough to be significant. Dr. Warden explains this on the basis of the training given preliminary to the experiment.

Dr. Warden urges further investigation to find out whether the standard Garand sights could be improved for ordinary daylight use. Details of his investigation are published in the *JOURNAL OF GENERAL PSYCHOLOGY* (April).

Science News Letter, August 26, 1950

denser of stainless steel, capable of withstanding the rigorous task of condensing sulphite liquor.

Sulphite liquor looks like black coffee and contains from 8% to 12% of solids. For processing, it is run through long vertical tubes in the condenser under high temperatures. The water comes off as steam and the liquor is boiled down to about one-fifth its original volume. The evaporated material, half water and half solids, has the consistency of molasses and under proper furnace conditions it can be burned.

A number of problems such as techniques of burning and of disposing of the fluffy ash that results remain to be solved. The problems differ in detail for each sulphite pulp mill.

Science News Letter, August 26, 1950

CHEMISTRY

British Use Color Test To Reveal Carbon Monoxide

► THE STANDARD British method of detecting the presence of poisonous carbon monoxide gas in the air in factories, garages and homes is now a war-developed process, which utilizes a small tube containing silica gel and a yellow reagent that is stained by the gas.

If carbon monoxide is present in the air drawn through the tube, even in very small quantities, the reagent is discolored. A dark brown stain appears at the junction of it and the gel. The length of the stain gives a measure of the amount of carbon monoxide in the air.

The adoption of this method as standard is announced in a recent publication of the British Department of Scientific and Industrial Research. Several methods of detecting carbon monoxide are presented in the leaflet but this war-developed method is described as best to give a rapid indication of the relative safety of the atmosphere.

The industrial tube recommended by the government agency is relatively small in size and has plain silica gel at each end with the yellow reagent between. This reagent is potassium pallado-sulphite. Air to be tested is forced through the tube by a rubber bulb. The function of the gel is merely to remove condensable vapors.

A version of this same carbon monoxide detector is in use in the United States. It was developed by the National Bureau of Standards and widely used during the war. The American government institution gave full credit to the British for the invention but its version, it claims, is more sensitive and better adapted to field conditions.

The Bureau of Standards describes its detector as using a yellow silica gel impregnated with a complex molybdate compound and catalyzed by means of palladium sulfate. The yellow mixture turns green if carbon monoxide is present in the air passed through it.

Science News Letter, August 26, 1950

CHEMISTRY

Fuel from Paper Mill Waste

► WASTE liquor from the paper industry's sulphite pulp mills—long Wisconsin's No. 1 industrial water pollution problem—may turn out to be a valuable "coal mine," if experiments by the Sulphite Pulp Manu-

facturers' Research league in Appleton, Wis., continue to be successful.

Scientists of the league, operated by paper mill owners, assert that the 1,400 tons of wood solids dissolved in the sulphite liquor produced daily in the state could become the equivalent of about half that many tons of coal if the sulphite-fuel theory can be worked out to become completely practical.

"Primary incentive behind the research is to find some economical method of getting rid of the sulphite liquor instead of flowing it into the streams," said J. M. Holderby. He recently resigned as director of the league to join the technical staff of the Rhinelander Paper Co., at Rhinelander, Wis., which is conducting experiments on the disposal of sulphite waste. "The waste material contains sugars, which decrease the oxygen dissolved in the stream water into which it goes. This makes the environment less desirable for fish life, and, under extreme conditions, drives fish out of the area," Mr. Holderby explained.

While studying paper making methods in Europe last fall, three league researchers found that Swedish mills were using a small amount of sulphite as fuel. Back in this country, they imported a Swedish con-



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HOLTER RESEARCH FOUNDATION
Helena, Montana

PSYCHOLOGY

Character Tops Looks

➤ GOOD CHARACTER and not good looks is considered most important by mentally healthy college students in picking a wife or a husband. This was shown by a survey of 118 well adjusted college men and the same number of college girls asked to indicate traits most essential and those least essential in a future mate.

In fact, beauty or good looks is rated as least essential by one out of four men and by two thirds of the girls surveyed.

Men and women are agreed in placing moral character, similarity of interests and intelligence at the top of the list of traits essential in a potential mate.

No one of either sex regarded education or congenial in-laws as most essential. No girls placed a top rating on good looks in a potential husband although 1.78% of the men consider it of top importance in a future wife.

In spite of minimizing the importance of education, a great majority (77% of the men and 92% of the girls) believe that a college woman should marry a college man. A somewhat smaller percentage (52% of the men, 66% of the women) think that a college man should marry a college woman.

Among both college girls and college men, college students are preferred for dates, the percentage with this preference being higher for girls than for men. But they had different reasons. The girls like the college date because "the college man is more mature," has "better prospects for the future" or "has more knowledge of what is going on in the world."

The college man likes to date college girls because they are "more level-headed," "more intelligent," or "more pleasant."

The few girls who prefer the business man date do so because they think him "more mature," "more independent," "more responsible." Most of the men who prefer the business date have nothing good to say about her, but they do not like the college girl, believing her "too smart for her own good," "too conceited," "too intellectual," "too snobbish."

Report of the survey by Drs. James P. Vail and Virginia M. Staudt, of Fairfield University, Fairfield, Conn., and Notre Dame College, Staten Island, N. Y., is contained in the JOURNAL OF PSYCHOLOGY (July)

Science News Letter, August 26, 1950

MEDICINE

➤ A FOUR-INCH long balloon with tiny silk brushes on the outside may help in better detection of stomach cancer. This is one of the most difficult of all cancers to diagnose in time to save the patient.

The silk brush balloon was designed by Drs. Frederick G. Panico, George N. Papanicolaou and William A. Cooper of Cornell University Medical College and Bellevue Hospital, New York. They announced it in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Aug. 12) in Chicago.

The idea is to brush from the stomach lining some of the loose cells shed by the cancer. These cells stick to the ends of silk which form the brush and are withdrawn with the balloon. They can then be transferred to glass slides and examined under the microscope.

Dr. Papanicolaou has previously shown that cancers shed cells and that if these can be washed or wiped off the body tissue they can be used for diagnosing cancer. With stomach cancer, it has been difficult to get any of the cells out of the stomach.

The abrasive action of the silk brush balloon does a better job of getting cells out for examination than other methods, Dr. Papanicolaou and associates find. Normal stomach lining resists having its cells brushed off.

The balloon needs to be perfected, though

in routine use it may not give as accurate results as in the test studies. But the results, the New York group believes, "give some basis for optimism" with regard to such a method for detecting stomach cancer.

For best results, the stomach must be empty and clean before the brush balloon is used. And the method cannot be used on patients with active bleeding from stomach or upper digestive tract.

The 70 patients on whom the new device was tried were put on a liquid diet the day before the test. The stomach contents were sucked out by stomach tube the night before. The balloon was swallowed uninflated the next morning. Then it was slowly inflated and moved back and forth so that the brushes would come in contact with all parts of the stomach. This was repeated five or more times during an hour. "Slight discomfort" was felt when the balloon went down the back of the throat.

Science News Letter, August 19, 1950

ASTRONOMY

Second Nova Found In Southern Sky

➤ A NOVA or exploding star has blazed forth in the southern sky close to where another nova of the same brilliance appeared on July 20.

Reported to Harvard Observatory from Mexico's Tonanzintla Observatory by Dr. G. Haro, director, the most recent "new star" was found on a photograph taken Aug. 7. Its announcement was held up because of fear that there was confusion with the earlier outburst that was discovered by Dr. Fritz Zwicky of Palomar Observatory, California. Both novae were 7.5 magnitude upon discovery, but the Zwicky nova has now faded to 11th magnitude.

The positions of the two stars are less than a degree apart, but that does not mean that they are actually close together in space or that the two explosions are connected in any way. Both novae are in the constellation of Scorpio.

A star of 15th magnitude, which is very faint, has been discovered on earlier photographs in the exact location of the Zwicky nova. This faint star which presumably became bright was found on plates at both Harvard's South African station and the University of Michigan Observatory.

Science News Letter, August 26, 1950

Some of the giant *tank ships* that carry crude oil and petroleum products will hold as much as 10,000,000 gallons.

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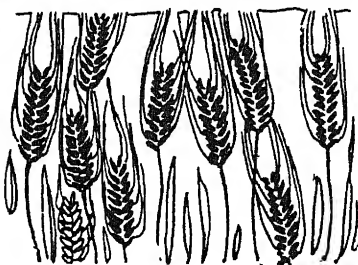
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BOTANY

NATURE
RAMBLINGS

Wheat

➤ ACROSS a million fields the combines
clank and clatter, their cutting bars flash-
ing in the sun. Dusty, sweating crews of
men, following a golden river northward,
cut a giant swath across the plains. Wheat
is coming in wheat, the most trium-
phant of all grasses, upon whose bountiful
kernels western civilization has grown for
7,000 years.

Into overflowing bins and towers, into
vast hangars once echoing with the roar
of U. S. war-time might, into rusting Lib-
erty ships lying at permanent moorings,
flows the endless stream of grain, too much
for 150,000,000 people, too much for sleek
cattle and tubby hogs

Seedtime and harvest, surplus and short-
age. The cycle is that of civilization itself.
Civilization built itself on wheat.

The earliest inscriptions on the tombs of
ancient Egypt and Mesopotamia show that
the peoples of prehistory fed largely on

two grains, barley and wheat. Barley came
first, but wheat was not far behind. From
these grains both bread and beer were made.

Wheat must have been cultivated around
the earliest campfire settlements, long be-
fore the Pharaohs. Kernels have been found
in ancient places where they fell 5,500 years
ago. The earliest wheat on record was al-
ready a cultivated, improved grass.

In those settlements, resurrected by ar-
chaeologists, have been found the tools of
grain: sickles of baked pottery, others
made of wood or bone edged with sharp
flakes of flint. In the age of bronze came
the earliest scythes of metal. Men grew
wheat while still hunting the wild animal
for meat and winter clothing.

Yet wheat today is so unlike any com-
mon wild grass that for a long time it was
thought the parent plant, the original wild
species, was extinct. But shortly before the
first World War, a brilliant young Jewish
botanist named Aaronsohn discovered wild
wheat growing on Mount Carmel in Pal-
estine.

The grain stem he discovered is unlike
cultivated wheat. The central stem of its
head, from which the kernels sprout, was
so brittle that it crumbled into pieces when
the grain was ripe. It could not be harvested
or threshed by modern means, nor perhaps
even by the hand methods of primitive
peoples.

But in their cultivation, men of the Stone
Age practiced plant improvement in some
unrecorded way, producing a solid head on
wheat many centuries before their wise
men learned to write down the story of
their exploit.

It is still that golden, waving grass by
which men and nations measure wealth
and power. On the Great Plains the wheat
is in. The staff of life is being harvested.

Science News Letter, August 26, 1950

• Books of the Week •

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Dept., SCIENCE NEWS LETTER, 1719 N. St., N. W., Washington 6, D. C. Ask for free publication direct
from issuing organizations.

THE ABC OF ACID-BASE CHEMISTRY. The Ele-
ments of Physiological Blood-Gas Chemistry
for Medical Students and Physicians—Horace
W. Davenport—University of Chicago Press,
3rd ed., 86 p., illus., paper, \$2.00. A guide
book brought up-to-date.

AETIOS OF AMIDA: The Gynaecology and Ob-
stetrics of the VIth Century, A.D.—James
V. Ricci, Translator—Blakiston, 215 p.,
\$7.00. Dr. Ricci has translated the Latin
version by Cornarius of the last chapter in
the encyclopedia of medicine on obstetrics
and diseases of women written originally by
Aetios of Amida, Court physician to Justin-
ian I, Emperor of Byzantium.

THE AMERICAN RED CROSS: A History—Foster
Rhea Dulles—Harper, 554 p., \$5.00. The
general history of the American Red Cross
covering operations during the past seventy
years.

**BIRD NOTES FROM BARRO COLORADO ISLAND,
CANAL ZONE**—Josselyn Van Tyne—University
of Michigan Press, 12 p., illus., paper, 25
cents.

BIRD'S-EYE VIEW OF THE PUEBLOS—Stanley A.
Stubbs—University of Oklahoma Press, 122 p.,
illus., \$3.00. A guide to the Indian villages
of New Mexico and Arizona, with aerial
photographs and scale drawings.

CANADA GEESE OF THE MISSISSIPPI FLYWAY.
With Special Reference to an Illinois Flock—
Harold C. Hanson and Robert H. Smith—
Natural History Survey Division, approx.
143 p., illus., paper, free upon request to
publisher, Urbana, Illinois. A report of a
study made of a flock of Canada geese winter-
ing in Alexander County, Illinois.

THE CHILD WHO NEVER GREW—Pearl S. Buck—
Day, 62 p., \$1.00. A mother's account of

the problems in rearing her mentally retarded child

CLASSICAL MECHANICS—Herbert Goldstein—*Addison-Wesley*, 399 p., illus., \$6.50 A text evolving from a course of lectures on classical mechanics given by author at Harvard University. Primarily designed for a graduate physics course.

CONTROLLED ACCESS EXPRESSWAYS IN URBAN AREAS A Symposium—Committee on Controlled Access Expressways in Urban Areas—*Highway Research Board*, 41 p., illus., 60 cents. A study of the many problems involved in relieving city traffic congestion by this method

THE EFFECTS OF ATOMIC WEAPONS—Samuel Glasstone, Executive Editor—*Combat Forces*, 456 p., illus., \$3.00 A cloth bound edition of a handbook identical with the original edition published by the Government Printing Office (See SNL, Aug. 19).

THE FATIGUE STRENGTH OF VARIOUS TYPES OF BUTT WELDS CONNECTING STEEL PLATES—Wilbur M. Wilson, William H. Munse and I. Sterling Snyder—*University of Illinois*, 60 p., illus., 50 cents The results of numerous tests conducted by the Engineering Experiment Station.

FERTILIZERS—*Food and Agriculture Organization of the United Nations*, 24 p., illus., paper, 25 cents A commodity report on the use of fertilizers throughout the world

HIGH-FIDELITY TECHNIQUES—James R. Langham—*Radcraft*, 112 p., illus., paper, \$1.00 A guide for amateur audio-engineers

HOW TO SAVE \$1000 A YEAR AT HOME AND HAVE FUN DOING IT—Margaret Gaddis—*Cummings Enterprises*, 96 p., illus., paper, \$1.00 Various helpful hints and suggestions on saving money for those with modest incomes.

IMPACT OF SCIENCE ON SOCIETY, Vol. I, No. 1—*UNESCO* (Paris), quarterly, 33 p., 50 cents per year for the first year, \$1.00 for the second year, single copy 25 cents. A quarterly bulletin devoted to abstracts in the field of the social and international implications of science.

INPUT IMPEDANCE OF A SLOTTED CYLINDER ANTENNA—Charles A. Holt—*University of Illinois*, 50 p., illus., paper, 40 cents A report from the Engineering Experiment Station on the use of the slot-cylinder antenna for frequency-modulated broadcasting and television.

LECTURES ON CLASSICAL DIFFERENTIAL GEOMETRY—Dirk J. Struik—*Addison-Wesley*, 221 p., illus., \$6.00 This book has developed from a one-term course given by the author for upperclassmen and graduate students at the Massachusetts Institute of Technology.

LECTURES ON FOUNDATION ENGINEERING GIVEN AT THE UNIVERSITY OF ILLINOIS, 1941-1942—A. E. Cummings—*University of Illinois*, 142 p., illus., paper, \$1.00.

LIQUID-METALS HANDBOOK A Guide to the Use of Liquid Metals as Heat-Transfer Media—Richard N. Lyon, Editor-in-Chief—*Gov't. Printing Office*, 188 p., illus., paper, \$1.25. A reference book on liquid metals sponsored by the Committee on Basic Properties of Liquid Metals, Office of Naval Research in collaboration with the Atomic Energy Commission and the Bureau of Ships.

LOOKING AT SYNTHETIC RESEARCH IN MELLON INSTITUTE 1949-1950—E. R. Weidlein, Director—*Mellon Institute of Industrial Research*, 48 p., illus., paper, free upon request to publisher, Univ. of Pittsburgh, Pittsburgh 13, Pa. The 37th annual report discusses present happenings and future goals of the Mellon Institute

MOMENTS IN TWO-WAY CONCRETE FLOOR SLABS—Chester P. Siess and Nathan M. Newmark—*University of Illinois*, 124 p., illus., paper, 60 cents A report of an investigation conducted by the Engineering Experiment Station

NEIGHBORS IN ACTION: A Manual for Local Leaders in Intergroup Relations—Rachel Davis DuBois—*Harper*, 294 p., \$3.00 A report growing out of a project in intergroup relations carried on in one of New York City's most culturally mixed neighborhoods.

NEW HANDBOOK OF THE HEAVENS—Hubert J. Bernhard, Dorothy A. Bennett and Hugh S. Rice—*New American Library*, 239 p., illus., paper, 35 cents A guide to the stars for the amateur. Cloth bound edition was originally published by *McGraw-Hill*.

NUCLEAR PHYSICS A Textbook—Francis Bitter—*Addison-Wesley*, 200 p., illus., \$5.00 A textbook intended for students who have had a course in atomic theory in addition to the usual introductory physics course.

OWLS—Herbert S. Zim—*Morrow*, approx. 62 p., illus., \$2.00. Discusses the owl and his many remarkable traits. Written for juveniles with excellent illustrations by James Gordon Irving.

THE PEOPLE OF GREAT RUSSIA: A Psychological Study—Geoffrey Gorer and John Rickman—*Chanticleer*, 235 p., \$3.00 An attempt by an anthropologist to arrive at an understanding of these people based on a study of their cultural traditions and methods of child care and in part on anecdotal accounts by a rural physician who worked in Russia for the Friends' War Victims Relief Unit.

PRINCIPLES AND PRACTICE OF SPECTROCHEMICAL ANALYSIS—Norman H. Nachtrieb—*McGraw-Hill*, 324 p., illus., \$4.50. Covers chemical-emission spectroscopy in the ultraviolet and visual regions of the spectrum. A college text.

PSYCHIATRY FOR SOCIAL WORKERS—Lawson G. Lowrey—*Columbia University Press*, 2nd ed., 385 p., \$4.50. A revised guide to aid social workers to recognize the symptoms of psychiatric disorders.

REVIEW OF LITERATURE ON DUSTS—J. J. Forbes, Sara J. Davenport and Genevieve G. Morgis—*Gov't. Printing Office*, U. S. Dept. of Interior Bull. No. 478, 333 p., illus., paper, 65 cents Discussion of the incidence, effects, determination and control of dusts.

THE STORY OF A STANLEY STEAMER—George Woodbury—*Norton*, 256 p., illus., \$3.00 The "biography" of the last model of a Stanley Steamer made by the Stanley Brothers.

STRATEGY IN POKER, BUSINESS AND WAR—John McDonald—*Norton*, 128 p., \$2.50. The editor of "Fortune" applies the mathematical theory of games developed by the atomic scientist, John von Neumann and Oskar Morgenstern to such social situations as poker, super markets, and atomic warfare. Written in non-mathematical language for the person who wants to gain understanding of our daily life

STUDY HIGHWAY SKIWAY SLAB-BRIDGES WITH CURBS Part II Laboratory Research—Mayon L. Gossard and others—*University of Illinois*, 79 p., illus., 45 cents A report on laboratory tests conducted by the Engineering Experiment Station of four skew slab-bridge models of reinforced concrete

SURGICAL NURSING—Eldridge L. Eliason, L. Kraefer Ferguson and Lillian A. Shultz—*Lippincott*, 9th ed., 728 p., illus., \$4.00 The treatment of surgical diseases and the social, economic and public health aspects of these diseases are presented

THE TREES OF PENNSYLVANIA—William Carey Grimm—*Stackpole and Heck*, 363 p., illus., \$5.00 A well-illustrated manual designed for the layman so that he might recognize trees native to this state, as well as most of the more common ones.

THE TSUNAMI OF APRIL 1, 1946—F. P. Shepard, G. A. MacDonald and D. C. Cox—*University of California Press*, approx. 135 p., illus., paper, \$1.75 A report of the most disastrous attack of long period gravity ocean waves in the history of the Hawaiian Islands.

UNITED NATIONS INTERNATIONAL CONTROL OF ATOMIC ENERGY—General Assembly—*United Nations* (U. S. Distributor Columbia University Press), 37 p., paper, 30 cents Official records of the resolutions, reports and statements made in this fourth Session of the General Assembly

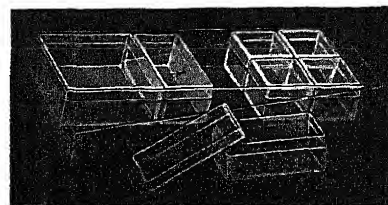
UNITED STATES ARMY COMBAT FORCES JOURNAL, Vol. I, No. 1—Joseph I. Greene, Ed.—*Association of the United States Army*, monthly, \$5.00 per year in U. S., \$6.00 foreign payable in advance, single copies 50 cents A merger of the Infantry Journal and the Field Artillery Journal. The chief purpose of this new journal is to support and improve combat efficiency through discussion and suggestion.

UNITED STATES GOVERNMENT ORGANIZATION MANUAL 1950-51—Federal Register Division—*Gov't. Printing Office*, 657 p., illus., paper, \$1.00. Describes the agencies in the legislative, judicial and executive branches and various international organizations. Revised as of July 1, 1950.

Science News Letter, August 26, 1950

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☼ **HELMET** for use in the showerbath, on which the government has recently issued a patent, is big enough to cover head, face and hair loosely with its lower edge resting on the shoulders. It is made of a stiff transparent material, and has breathing openings covered by shields.

Science News Letter, August 26, 1950

☼ **ENVELOPE SEALER**, to wet the adhesive on the flaps, has a plastic casing within which is a sponge roller, and a handle which supplies water for wetting. The handle is a flexible plastic, which is easily filled with water and from which the water is released to the roller by a light squeeze.

Science News Letter, August 26, 1950

☼ **SCREWDRIVER** for electricians and automobile mechanics has a replaceable tiny neon tube within its shock-free plastic handle which lights when the blade contacts a high-voltage circuit. The neon tube is placed under a transparent cover in a slot in the black handle.

Science News Letter, August 26, 1950

☼ **DRAPERY PLEATERS**, shown in the picture, are zinc-plated steel pins for home use with which perfect pinch or box pleats can be made. They come in sets, each con-



taining 10 pleaters, four brass pin hooks for curtain ends, and two patterns with instructions.

Science News Letter, August 26, 1950

☼ **TAILGATE LOADER** for pickup trucks, which can lift from ground to truck-floor-level a 1000-pound package on its elevator-like platform, is powered by a

fan-belt driven hydraulic pump on its own self-contained clutch. When not in use as an elevator, it can serve to lengthen the floor of the truck.

Science News Letter, August 26, 1950

☼ **PROTECTIVE MASKS** for workers in dust-laden industrial atmosphere consist of aluminum shields, to fit over nostrils and mouth, within which are replaceable filters of extra thickness. Masks weigh less than a half-ounce and are said to be cooler than other types.

Science News Letter, August 26, 1950

☼ **BRANDING IRON** for range livestock is electrically heated from an ordinary household outlet, a portable generator or the battery of a truck or tractor. It is designed to replace older irons heated on an open fire. Different branding heads may be used on this recently patented device.

Science News Letter, August 26, 1950

☼ **REFLECTIVE FABRIC** to help keep the body warm is made of cotton fibers treated with aluminum pigment. When woven into cloth, these fibers reflect radiant heat. Clothing made from the cloth would send heat from the body back to the body instead of permitting its escape.

Science News Letter, August 26, 1950

Do You Know?

Sugar helps hold the flavor and texture of fruits in canning or freezing.

Some fish in streams eat seeds dropped from trees overhanging the water.

A dairy cattle breed may produce meat just as high in quality as that from a beef breed.

An analysis of quail crops shows these birds eat seeds from over 300 different plants.

Females have a change in voice during adolescence somewhat similar to the change in male voices.

Adults are partial to rose-like smells, according to a scientist studying people's likes and dislikes in odors; children lean to spearmint and other strong, simple odors.

To protect the California condor from extinction, the U.S. Government is considering a plan to set aside 32,000 acres of land in the Los Padres National Forest as a condor sanctuary.

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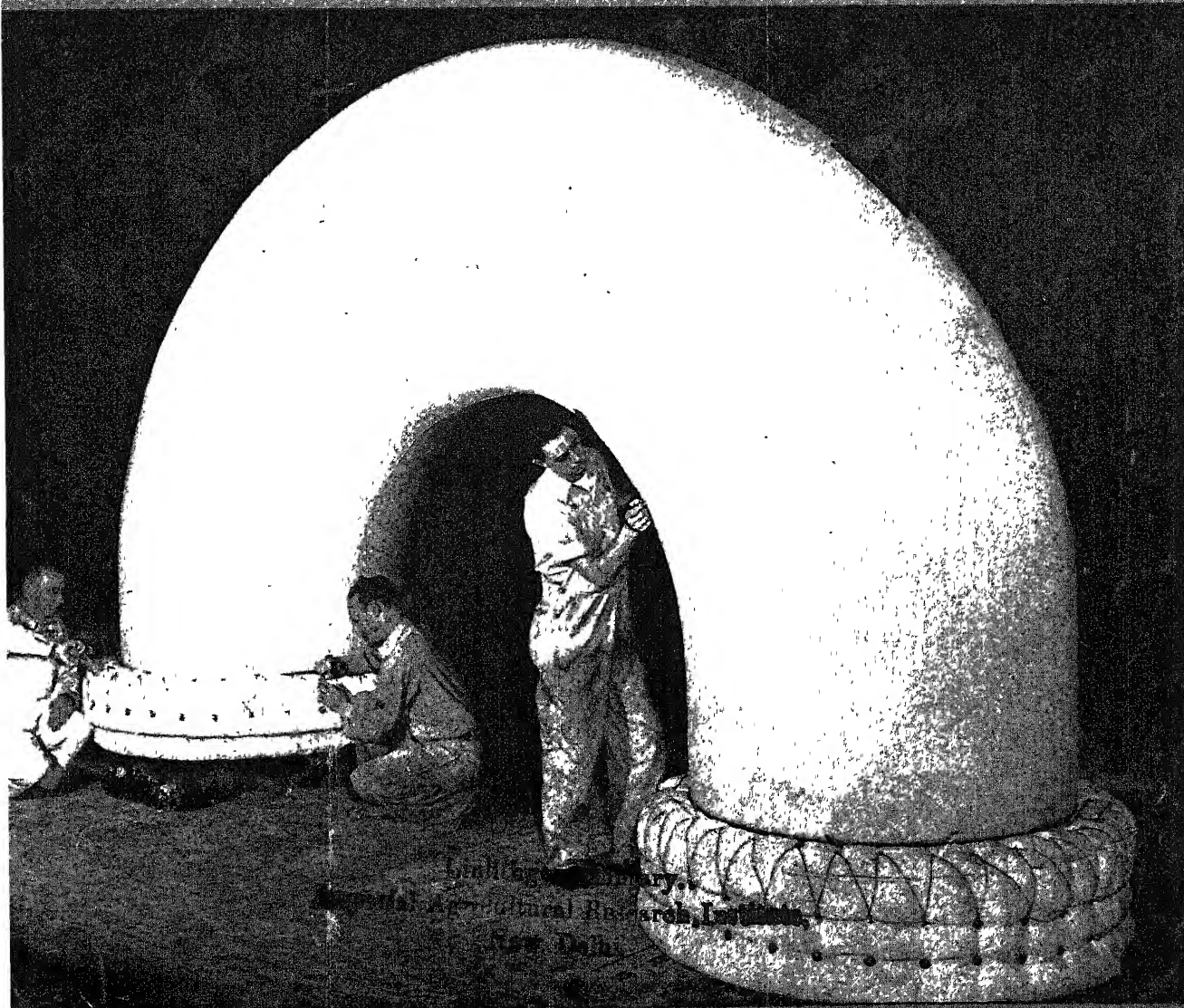
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THE WEEKLY SUMMARY OF CURRENT SCIENCE



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PSYCHOLOGY

From Now On: Behavior

A more scientific knowledge of human behavior and an application of the principles in relations between nations is a must for the future in order to realize world peace.

Twenty-third in a series of glances forward in science.

➤ TO keep people from fighting each other, either in the sense of a cold or a hot war, is the objective of international relations among nations, as well as all government and policing within nations and the states.

Peace in the world is to a large extent an extension to nations of the problems that all of us have within our families, cities and states.

Relations between nations have been traditionally the problems of diplomats, military men, industrialists, business men, and historians.

As the world recovers from the physical and mental wounds of two great world wars, some of those charged with running the world have awakened to the possibility that scientists can help them in the maintenance of the peace. Psychological warfare was used effectively in fighting the war. Psychological welfare can be promoted to keep the peace.

Even nations which regard themselves as most friendly neighbors have areas of tension. There is conflict in the cold war as there is in a fighting war.

The facts in these tensions on an international scale are beclouded by stereotyped thinking, nationalistic feeling, catch phrases and slogans. This is just as true of world politics as it is in a hard-fought, "dirty" city election.

In recent years sociologists, anthropologists and psychiatrists have learned a great deal about the way in which people think and feel. They know that what often seem to be the obvious reasons for an action are not at all the causes. There are hidden reasons for many things that happen—hidden in the human mind and past experience.

There has been a great advance in methods of determining, by polls, questionnaires, by probing into attitudes, by interviews, just what people feel and why they do what they do. There have been practical experiments on how to modify and change attitudes which may cause trouble in the world. Conflicts over "race" and prejudices against Negroes, Jews, Communists or any other minority group are often caused by lack of information or experience and background.

Why are groups often hostile toward other groups? The influences that make for

aggressive nationalism are very important in our world which is so far from being united. History is full of examples, as in Germany and Japan, where a military career was the highest achievement to which a boy could look forward. Militarism may be ingrained in the culture, and yet this does not mean that war is inevitable, or that it is a fundamental part of human nature.

The psychiatrists study hostile individuals bent upon personal or social harm. These individuals throw some light upon the origins of war itself.

An important achievement of UNESCO has been the study of the whole problem of these so-called social tensions affecting

VETERINARY MEDICINE

Immunity from Dog Plague

➤ SAVING the lives of many pets is now possible with the development of effective immunization and treatment of leptospirosis, a disease capable of decimating dog populations and an increasingly great health hazard to man.

An antigen capable of conferring immunity to dogs, and probably to man, has been developed in the Hooper Foundation at the University of California Medical Center by Dr. Karl Meyer, director, and K. T. Brunner, researcher.

The scientists also reported that streptomycin and aureomycin are highly effective in the treatment of dogs contracting the disease, which often takes a death toll as high as 85% of the animals afflicted in an epidemic.

Dr. Meyer, whose work was supported by the National Canine Research Foundation, Inc., New York, said that dog owners could protect themselves against possible loss of pets by having their dogs treated thoroughly with streptomycin before they are discharged from kennels or dog hospitals.

Leptospirosis, which is also known as Stuttgart dog plague, is caused by rat-borne spirochete-like organisms of two principal types: *leptospira canicola* and *leptospira icterohaemorrhagiae*. A source of infection for man, dogs, hogs and possibly cattle is contact with objects soiled by the urine of rats.

Dogs infect each other, and also pass the disease along to man by close contact, for example when an animal licks his

international understanding. Dr. Otto Klineberg of Columbia University has just brought together a survey of research in this field.

As yet the experts in this field of science do not sit down with the statesmen and the generals and the admirals.

For the future we may expect:

A. Those who understand human behavior—why people act the way they do—will play a larger role in advising on the conduct of international relations and the preventing of future wars.

B. Just as the people generally now have a better idea of the usefulness of psychology and psychiatry in the conduct of their personal and family lives, so there will be more general understanding of the need of exploring human behavior in relations between peoples and nations.

C. The peace-promoting activities of the various United Nations agencies, our Department of State and the equivalent or organizations in other countries will be more firmly based upon the facts of human behavior.

Science News Letter, September 2, 1950

master's hand at a place where it may be scratched.

In man the infection is known as Weil's disease. A variant is swineherd's disease, which is contracted from hogs. The disease is not nearly so deadly in man as it is in dogs. The victims usually recover after a siege of fever, with jaundice occurring in about 60% of cases.

The disease is found frequently among individuals working under unsatisfactory sanitary conditions, including poultry handlers, slaughterhouse employees, fish workers, junk peddlers and gardeners. It is also prevalent on the Island of Hawaii among the cane field workers.

Dr. Meyer said that although only 229 human cases have been reported in the U. S. in the past 40 years, improving laboratory techniques indicate that the incidence is much greater. For example, 78 cases were diagnosed in the Detroit area alone between 1937 and 1946.

Tests show that significant percentages of dog populations in widely separated areas of the U. S. have survived mild infections. The infection rate in small groups of dogs was 19% in southern California, 34% in San Francisco, 38% in Pennsylvania.

The immunizing antigen was prepared by inactivating leptospira organisms by freezing. Earlier antigens prepared by heat inactivation have been less effective. Dr. Brunner tried the antigen on himself with no adverse effects, so that it apparently is useful in man. The antigen protects only against leptospira canicola. An antigen to the other organism is now being prepared.

Science News Letter, September 2, 1950

ANTHROPOLOGY

Swaddling of Russian babies is believed partly responsible for the adamant Russian spirit. For them truth is an absolute, and compromise is inadmissible except as a tactic.

➤ BECAUSE Russian babies are bound with swaddling cloths into a rigid, immobile bundle, the world must contend with a stubborn people whose characters are distorted by these bonds.

That the custom of swaddling infants is one factor determining Russian adult character is the conclusion of the anthropologist Geoffrey Gorer whose analysis of the Russian character is published in a new book, *THE PEOPLE OF GREAT RUSSIA*, by Geoffrey Gorer and Dr John Rickman (*Chanticleer Press*)

You were not swaddled. The American baby passes his infancy clothed in loose, light clothing. He can reach out to touch or grasp whatever attracts his attention. He can kick at will. If he is angered at anything, he can flail the air with both arms and legs, can arch his back, can express his emotion with his whole body.

The Russian infant from the moment of birth is tightly swaddled in long strips of material that hold his legs straight and rigid and bind his arms tightly down at his sides.

Although this restriction of movement is enraging to an infant, all the Russian baby can do is to scream and that is soon stilled by a comforter. After that he can give expression to his bottled up rage only with his eyes—no other part of him is capable of movement.

All non-Russians tend to notice the great expressiveness of Russian eyes, and most Americans know Russians mainly through the song, "Dark Eyes."

At intervals—whenever he is hungry—the baby is taken to his mother, his swaddling taken off and he is caressed and put to the bountiful breast. Thus he goes from one extreme of complete restraint to the other of complete freedom and satisfaction.

In this alternation of treatment, Dr. Gorer sees one of the explanations for those abrupt about-faces for which the Russians are famous in international gatherings where they may change suddenly from a rigid negative attitude to one of smiling assent.

Russian soldiers are also known to switch abruptly from brutality to gentleness. Those who have visited in Russia have been struck by the Russians' endurance of privation alternated with bouts of heavy drinking and extravagant eating.

Teething normally starts while the infant is still swaddled, and this may explain why the Russian's rage is associated with the teeth and with biting off or gobbling

up. Russian folklore has a character of a witch baby with iron teeth who devours her parents. Russian propaganda frequently describes their enemies as cannibalistic. They live in the constant fear that their enemies will devour them. It is interesting that Soviet dental service provides false teeth made of stainless steel.

"For several months, at least," writes Dr. Gorer, "the Russian infant experiences intense but relatively undirected rage and fears deriving from his projection of this rage on to the external world; as a result of this he develops a feeling of pervasive though unfocused guilt."

Dr. Gorer sees an explanation for the "confession complex" in the early religious training of the Russian child. From about the age of five, the Russian child goes to confession. He kneels at the feet of the priest, but instead of giving a free account of his wrong-doings, he is instructed to answer "I am guilty, father" to questions put by the priest accusing him of some sin or other. It is not considered a lie to confess to sins one is not conscious of having committed, but it is considered sinful pride to deny sins of which the confessor accuses one.

The Russian, by tradition, does not understand rule by majority vote, Dr. Gorer points out. To the Russian there is but one truth or right decision on any question and all must comply to it. In the Russian version of the town meeting, the "mur," a member who is in disagreement with the general consent has only one outlet—to separate himself from the meeting. Is this why the Russian delegates are forever walking out of meetings where they find themselves in a hopeless minority?

To a Russian, the leader, whether he is a Czar, Lenin or Stalin, has always been completely idealized by the mass of the population which loyally adheres to the regime. "He is," says Dr. Gorer, "in the most literal sense of the word, superhumanly perfect in knowledge, truth, and foresight."

"He is so idealized that the ordinary person cannot imagine himself thinking or feeling as the leader would do."

It is for this reason that the Soviet representative must always consult with Moscow before making any decision or announcing any course of action.

To the Russian, says Dr. Gorer, compromise is inadmissible except perhaps as a tactic, and there is no possibility of a "loyal opposition." All men of good will must recognize the truth when it is pointed

out to them; if they refuse to recognize it, *this shows their wicked characters and evil intentions*. To accept the decision of the majority, without the appropriate internal convictions, is for Great Russians the abandonment of all honor and self-respect.

The Russian has no concept of relative truths or aspects or versions of the truth. The truth for him is one and absolute. It is a system of interconnected items, arranged in a hierarchy but in such a way that the destruction of one item jeopardizes the whole system.

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GENERAL SCIENCE

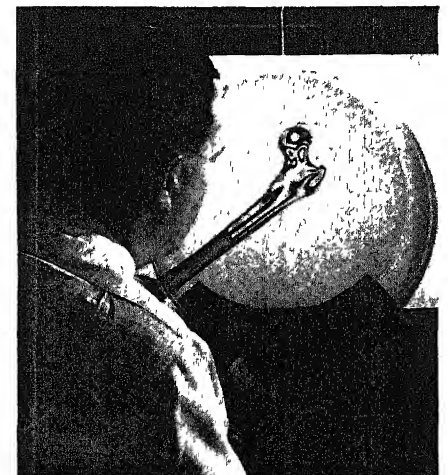
U. S. Can Live in Peace With USSR by Firm Policy

➤ IT IS perfectly possible to work out a way of living with Russia indefinitely without war but only through a policy of permanent strength, firmness and consistency.

This is the conclusion of anthropologist, Geoffrey Gorer, on the basis of an analysis of the Russian character made in collaboration with a psychoanalyst, Dr. John Rickman. The analysis together with recommendations for dealing with the Russians is published in a new book, *THE PEOPLE OF GREAT RUSSIA*, (*Chanticleer Press*).

Dr. Gorer's conclusions are:

"It is useless to try to make friends with, or win the sympathy of, the mass of the Great Russian people, in the hopes of producing transformations of policy. The mass of the people never have had, and (in any foreseeable future) are not likely to have



INSIDE VIEW—The color pattern "frozen" into this plastic model of a human leg bone reveals to Milton M. Leven where fracture might occur if bone were subjected to jarring impact, as in jumping from a height. Concentration of stress lines in socket where bone joins hip shows this to be the danger zone.

any appreciable influence on the policies their leaders adopt. . . .

"No techniques are yet available for eradicating the all-pervasive suspicion which Great Russians, leaders and led alike, feel towards the rest of the world. This suspicion springs from unconscious and therefore irrational sources and will not be calmed, more than momentarily, by rational actions. . . .

"In negotiations with the Great Russians, a successful outcome is most likely if negotiations are phrased in the terms of the most concrete and symmetrical equality: man for man, ton for ton, acre for acre, town for town and so on. In the view of Great Russians, the only alternative to the most rigorous equality is for one of the parties to be completely subordinate, and they always have the fear that they may be forced into the position of absolute weakness.

"Ideological arguments, notes of admonition and disapproval, and the like, are a complete waste of time and energy, as far as the Great Russians are concerned. With the Great Russian concept of truth, *pravda*, it is impossible for them to admit error in any one instance, for that would destroy their whole system of Truth and their self-esteem. . . .

"There is no likelihood of Great Russians voluntarily engaging their country in any form of international organization which might conceivably give to other countries the possibility of constraining them. Consequently, it is a waste of time to discuss, for example, the abolition of the veto in the Security Council of the United Nations. . . .

"Although the Russians will resist every encroachment, while themselves encroaching to the greatest possible degree, there would seem to be no necessity for war between the Western Powers and the U.S.S.R. The one situation which might evoke war (apart from the Western Powers 'compressing' Russia) would be if the

Western Powers manifested such weakness, or such alternations between strength and weakness, that the Russians would feel compelled to advance to such a degree that the Western Powers would feel that the menace was intolerable."

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ENGINEERING

Photo-Plastic Puts "X" On Strains in Machines

➤ MACHINE parts made of transparent plastic, instead of metal, are coming into wide use by technicians to let them see with their eyes the results of operation actions.

This so-called photo-plastic, first announced a year ago, is now being employed in gun factories, naval laboratories, airplane plants, arsenals and universities in the design of stronger machinery and equipment. The three-dimensional models cut from the plastic enable scientists to get a "portrait in color" of the strains encountered in tools, machine parts and other objects.

The plastic used is a modified form of Fosterite, a tough, waterproof material developed by Westinghouse scientists during World War II to seal radio and radar parts against moisture damage. The new material was developed by Milton M. Leven and Herbert F. Minter, both of the Westinghouse Research Laboratories. It can be cast in chunks from ten to 20 times larger than any other resin formerly available for strength studies, it is claimed.

One of the major uses of this plastic is in the design of breech blocks for big guns. To understand the terrific stresses these parts undergo during firing of the gun, an exact three-dimensional model of the block has been built and "loaded" to simulate the stress.

When frozen into the material and then viewed through special polarized light, the stress pattern appears as a series of varicolored lines. These tell the scientist where the major stresses are located, in which direction they are acting and just how great they are.

Science News Letter, September 2, 1950

Both New York and Pennsylvania have more acres of land in *crops* than all the New England states combined.

SCIENCE NEWS LETTER

VOL. 58 SEPTEMBER 2, 1950 No. 10

44,100 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W. Washington 6, D. C., North 2255 Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50, 2 yrs., \$10.00, 3 yrs., \$14.50, single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925, 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STAt 4439.

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ANTHROPOLOGY

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BOTANY

What shrub many years ago was believed to protect from lightning? p. 158.

ENGINEERING

What cereal cleans carbon from car engines? p. 158.

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MEDICINE

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What malady is caused by resentment? p. 155.

MILITARY DEFENSE

How does Uncle Sam's namesake nephew protect him? p. 158.

MEDICINE

Cancer Hospital Opens

Ewing Hospital in New York will be devoted to the research task of better treatment of cancer. Patients will be treated, and the search for a cure will continue.

➤ THERE is new promise that there will be fewer incurable, hopeless so-called "terminal" cases of cancer in the years to come.

A \$6,000,000 pile of bricks, concrete, tile and stainless steel, paid for by the people of New York City, was dedicated in New York to the research task of better treatment of the disease that takes the lives of one out of every five New Yorkers. This new 275-bed hospital is named for Dr. James Ewing, a pioneer in cancer research at the famous Memorial Center in which the new Ewing Hospital is integrated.

Although the new Ewing Hospital is owned and operated by the city, it will function as a part of the group of research hospitals and institutions which include the Memorial Hospital, Sloan-Kettering Institute, Cornell Medical College and the New York Hospital.

Suffering will be eased within these bright new walls. But more important, the great fight to learn more about malignant diseases and their treatment will be advanced.

Dr. C. P. Rhoads, director of the new

hospital and of Memorial Center, is confident that many of the cancer patients now called hopeless will be checked by new techniques and even "cured" in the sense of staying alive for five years or more.

In the past three years techniques have been developed at Memorial Hospital that promise 15% to 20% such "cures" in pelvic cancer that previously would have been labeled incurable. One of the tasks of Memorial Center, including the new Ewing Hospital, is to give scores of physicians experience in new methods so that they may treat cancer in general hospitals and private practice throughout the world.

The more extensive peaceful use of atomic energy, Dr. Rhoads said at the dedication, is to destroy cancer. Suitable patients are being sent regularly for certain forms of atomic treatment from the Memorial group of hospitals to Brookhaven National Laboratories, where a new atomic reactor has just been put into operation.

Even some of the poisons developed for chemical warfare are now employed in the

control of cancer. The improvement and extension of methods of warfare are related to cancer research.

"The training of disease-producing viruses to pursue and to destroy cancer," said Dr. Rhoads, "is in principle and method their training to destroy our enemy, his animals or his food crop. To develop for peaceful purposes these weapons of war, and the protection against them, is the function of our Memorial Cancer Center."

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CHEMISTRY

Electrical Fields Distort Atoms in Catalytic Action

➤ SOME of the mystery of catalytic action has been solved by Dr. W. A. Weyl of the department of mineral technology of Pennsylvania State College.

Catalysts speed up chemical processes by their mere presence, without taking any part in the reaction, and are widely used in oil refining and other industries.

Electrical fields inside the atoms, which pull and distort the shape of atoms near the surface, and so make them act in an unusual way, are responsible for the catalytic effect, according to Dr. Weyl's interpretation. Some of the unusual colors of crystals and certain trade secret processes can be explained by the same action of warping and crowding of surface atoms.

One such is the process of swabbing the glass in mirror manufacture with a solution of tin salt, which is thoroughly washed off before the silver is applied. According to Dr. Weyl's theory, enough deformed tin atoms cling to the surface of the glass to present on their free side a metallic film to which the silver will become attached.

The new theory also accounts for the so-called poisoning of catalysts by certain types of compounds. Poor materials can be improved and good ones made better for catalytic purposes as the theory of their action becomes better known. Dr. Weyl presented his theory at a recent meeting of the New York Academy of Sciences. His work is sponsored by the Material Branch of the Office of Naval Research.

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AERONAUTICS

Plane's Detachable Cargo Compartment Is Versatile

➤ THE detachable box-car-size cargo compartment of the new Fairchild military plane, which has now made its maiden flight, is suitable for many uses.

It might be fitted out as a surgical operating room to be landed all ready for use in advanced combat areas. Air Force medical men consider this feasible but say it would be costly because all the equipment and instruments would have to be specially designed and made. Although some light weight equipment is now on



CANCER CENTER—A view of the new James Ewing Hospital, First Avenue and 68th Street, dedicated and opened by Mayor O'Dwyer on August 23, 1950. The hospital represents a cooperative undertaking between the Department of Hospitals, City of New York, and Memorial Center for Cancer and Allied Diseases.

hand, no budget planning for an airborne operating room has yet been done

With proper equipment, it could serve also as a forward photographic laboratory to give combat units quick information from aerial photographs. Outfitted as a kitchen, it could provide hot food for fighting men.

The advantage of this new airplane is that it can deposit its cargo compartment, which is bigger in bulk than the plane itself, wherever needed and then take off to pick up another compartment to carry it where wanted.

In its functions the plane is somewhat like the powered units that haul giant trailers on highways. When the tractor unit reaches its destination for loading or unloading, it is transferred to another trailer to start on another highway trip.

In general appearances while in flight, this new plane, built in Hagerstown, Md., by Fairchild Engine and Airplane Corpora-

tion for the U. S. Air Force, is similar to the well-known Fairchild Packet. Its cargo compartment fits snugly to the belly of the long slim plane itself, appearing as an integrated unit.

The carrier plane, as the powered unit might be called, has wing-mounted engines, and struts extending to its landing gear long enough to permit it to straddle a cargo compartment on the ground. When the compartment is attached, the plane takes it off through the air.

Wider use of the cargo compartment is promised with a helicopter carrier under development by the Piasecki Helicopter Corporation, Morton, Pa., according to a Fairchild announcement made within the year. The idea is that the helicopter would be able to straddle a compartment deposited on a nearby airfield and carry it into rough country where airplane runways do not exist but where fighting men need equipment and supplies.

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further the health of the American people.

At the present the Surgeon General, Dr. Leonard A. Scheele, does not think any additional institutes are needed or will be in the immediate future. The rheumatism institute includes "metabolic diseases" which, he explained, takes in a wide variety of chronic diseases such as diabetes and various glandular disorders. Deafness, he added, might well be included in the field covered by neurological institute.

Each of the two new institutes will have its own advisory council, just as the existing institutes now have. Each of the councils, new and old, will in the future have half its membership made up of lay persons and the other half of doctors or dentists or other scientists.

Before passage of the new law, there were six National Institutes of Health dealing with cancer, heart diseases, dentistry, mental health, experimental biology and medicine, and microbiology.

Research into rehabilitation for patients already afflicted with crippling and disabling diseases will be pushed as part of the program of the new neurological institute.

While the new and old institutes will be primarily devoted to attacks on diseases through research into causes, treatment and prevention, some of their work will be carried on through training of future scientific specialists and some will be devoted to fundamental research of the kind that often does not look immediately practical. The value of this kind of research was shown during World War II and, more recently, in the discovery of cortisone for arthritis.

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MEDICINE

Anti-Disease Bill Passes

The Omnibus Research Bill which declares total war upon disease has passed. Two new research institutes will be established.

➤ THE U. S. Public Health Service is set to fight total war against disease, now that the so-called Omnibus Research Bill has been signed by President Truman and become law.

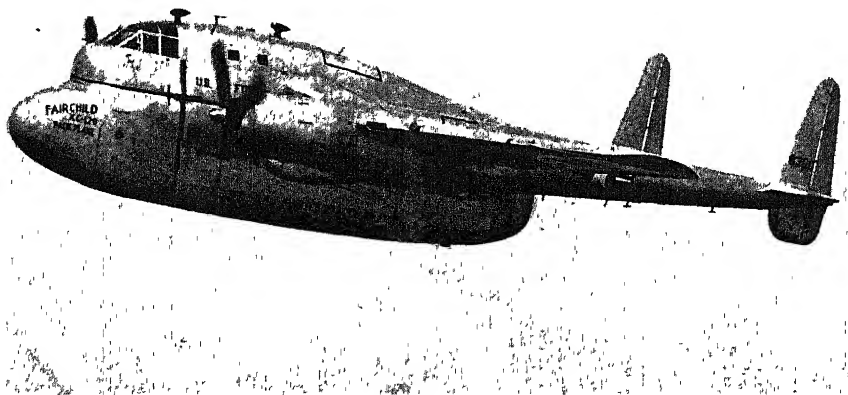
As a result, your heart may beat longer, your joints may never stiffen with rheumatism, your children may never know the pain of toothache, you may be spared the anguish of seeing a child or grandchild forced to grope through life with blind eyes or chained to a wheel chair because of some disease like multiple sclerosis.

The new law authorizes the federal health service, through its National Institutes of Health, to attack disease on a broad front ranging from cancer and heart trouble to blindness, deafness and some of the mystery diseases in which nerves, muscles and bones fail to work properly.

The hopes and prayers of millions of sufferers from multiple sclerosis, cerebral palsy, epilepsy, rheumatism and arthritis, are one step nearer fulfillment because of the broadened range of research and training which will become possible if funds are appropriated to put the provisions of this law into effect.

Specifically, two new national research institutes are authorized. These are: 1. National Institute on Arthritis, Rheumatism and Metabolic Diseases, and 2. National Institute of Neurological Diseases and Blindness. But the new law also authorizes

the Surgeon General of the Public Health Service to establish one or more additional institutes dealing with other diseases, for example, poliomyelitis and leprosy, whenever he considers these needed to improve



FIRST DETACHABLE FUSELAGE—The giant detachable cargo compartment in a military transport allows for faster ground handling and loading times. The compartment can also be fitted out as a surgical operating room or a forward photographic laboratory for advanced areas.

MEDICINE

Starvation Affects Heart

The heart grows smaller when food intake is reduced to that of a semi-starvation diet. At the end of six months the subjects showed the signs of famine victims.

➤ WHEN a man is on a semi-starvation diet, his heart grows smaller.

In the Minnesota Experiment, made at the University of Minnesota in Minneapolis with 32 conscientious objectors during World War II, X-ray measurements of heart size showed that the heart volume decreased 17 percent during six months of semi-starvation.

These findings, contrary to statements "in every major textbook of physiology since 1900," are reported by Drs. Henry Longstreet Taylor and Ancel Keys in the journal, *SCIENCE* (Aug. 25).

The brain, on the other hand, and the skeleton and the proteins of the blood serum remain almost intact during semi-starvation.

Fat, muscle, liver and skin, like the heart, undergo large losses

But although the heart grows smaller, the work done by it during starvation decreases by about half. This is a protective change that can be considered an adaptation of the body to the stress of starvation

The way in which the body adapts to a starvation diet, however, is quite different from the way it adapts to such stresses as high-altitude living, heart disease or an increase in temperature of the environment, the Minnesota scientists point out.

Much of the adaptation during semi-starvation is, they state, "an automatic consequence of the use of the body itself as fuel for the metabolism. The life of the organism is prolonged or maintained closer to normal than would otherwise be the case by the rather desperate expedient of reducing the mass activity of the organism. This mechanism, it seems to us, is entirely passive and produces major limitations and stresses of its own."

In contrast, the man who has to live at a high altitude where the atmosphere has a lower partial pressure of oxygen, achieves a more positive adaptation.

"He reduces his demand for high rates of oxygen supply by reducing the intensity of physical work, but does not alter his oxygen use or rate of life at rest or with moderate activity. Adaptive mechanisms provide oxygen to the body in normal amounts for all but extreme exertion. The changes include an increase in red (blood) cell concentration, a higher rate or pulmonary (lung) ventilation and a change in the acid-base balance of the blood."

The man who travels from a cool to a hot environment, the scientists state, adapts

to this stress by a more efficient elimination of heat from the body through an improved performance of heart and blood vessels and, apparently, through a reduction in basal heat production. Safety with a high rate of sweating is assured by a change in the composition of the sweat.

The men in the Minnesota Experiment lived for six months on a diet of potatoes, cabbage, turnips and cereals with only a few grams of animal protein a week. The diet provided an average of 1,570 calories daily, or slightly less than half the 3,492 calories the men consumed each day of a three-months control period before the semi-starvation diet

At the end of six months of this diet, the men had lost 24% of their body weight and showed the classical signs and symptoms of famine victims, such as dropsy, anemia, disturbed heart and kidney function, weakness and depression. They lost strength and endurance to a marked degree, and said they felt "as if they were rapidly growing old. They felt weak and they tired easily. They moved cautiously, climbing stairs one step at a time and obviously reduced unnecessary movements to a minimum"

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MEDICINE

Powerful Drug, Tapazol, Treats Thyroid Trouble

➤ TRIALS of a new drug for treating certain kinds of thyroid trouble which is 25 times as powerful as one of the anti-thyroid drugs now used are reported by Drs. William S. Reveno and Herbert Rosenbaum of Harper Hospital and Wayne University College of Medicine, Detroit, (*JOURNAL AMERICAN MEDICAL ASSOCIATION*, Aug. 19).

The new drug is called tapazol, short for 1-methyl-2-mercaptoimidazole. It is not yet on the market for general use. The Detroit doctors got their supply from the Lilly Research Laboratories.

Because it has been tried on only 18 patients for six months, the results, though promising, are considered preliminary. It was used for the kinds of thyroid trouble in which the gland is overactive, such as cases of toxic goiters.

It is "fully as efficient as thiouracil and propylthiouracil" and 25 times as potent as the latter drug. It differs chemically from

these well known anti-thyroid drugs in having a five-membered rather than a six-membered ring structure

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AERONAUTICS

Eight-Bladed Propellers For Turbo-Prop Engines

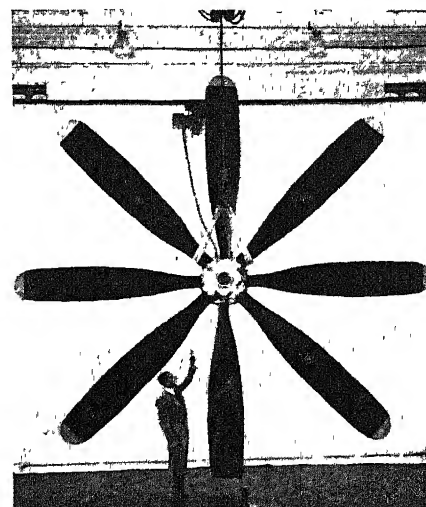
➤ EIGHT-bladed giant propellers over 19 feet in diameter, said to be the world's largest and most powerful, were revealed in Caldwell, N. J., by the designer and builder, the Curtiss-Wright Corporation.

They are designed for the U. S. Air Force for use on speedy planes equipped with gas turbine engines, turbo-props of 10,000 to 15,000 horsepower. They are dubbed the "Octoprop."

The Octoprop dwarfs in size and performance all previous propellers for either reciprocating or turbo-prop engines, officials state. The propeller is a dual-rotation type. Two sets of four blades whirl in opposite directions on a specially geared shaft. They give thrust enough to lift a fully-loaded plane of the giant four-engined DC-6 type.

The blades of the Octoprop may be feathered, or turned at an angle to reduce drag in the event of engine failure. They may be reversed in action for use as an aerodynamic brake to shorten landing runs. Among other features are automatic constant speed operation and provision for heated air de-icing. The eight blades are of hollow steel construction.

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"OCTOPROP"—The eight-bladed, 19-foot diameter, dual-rotation propeller dwarfs William E. Burns. Designed for an engine of 10,000 to 15,000 horsepower, it has a rated thrust in excess of the force required to lift a 4-engined transport of the Douglas DC-6 type off the ground with maximum load.

CHEMISTRY-MEDICINE

Change in Cell Chemistry May Be Step in Cancer

➤ A CHANGE in fundamental cell chemistry which might be a first step toward the development of cancer has been discovered by Drs. Antonio Cantero, Roger Daoust and Gaston De Lamirande of the Montreal Cancer Institute and Notre-Dame Hospital in Montreal, Can.

During the transition stage when a cell is becoming cancerous, enzymes which break down the acid in the cell's nucleus behave differently than they do after the cell has become cancerous, the Montreal scientists find.

They worked with white rats that had been fed a diet of cooked polished rice and an azo dye. This diet caused an irreversible liver cirrhosis which the scientists consider a sign that cancer is going to develop. The enzyme activity of these pre-cancerous rat livers increased progressively up to the 90th day the rats were on the special diet. Then the enzyme activity decreased progressively for the rest of the 150 days of the diet.

Previously it has been shown that the nucleic acid these enzymes affect is changed in cancer. Whether the change is a first step in producing cancer or merely accompanies the development of cancer is not yet definitely known. These studies however, were made of nucleic acid in normal and cancer cells. The studies of the Montreal scientists, reported in the journal, *SCIENCE* (August 25), were made on cells during the transition stage between the normal and cancerous states.

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ASTRONOMY

New Observatory for Southern Hemisphere

➤ A NEW astronomical observatory will be established in Australia, it was announced recently in New Haven, Conn.

A joint venture of three universities, Yale, Columbia and Uppsala, Sweden, the observatory will be located on Mt Stromlo, near Canberra, capital of Australia.

The two American universities now operate a joint observatory, the Yale-Columbia Southern Station, at Johannesburg, South Africa. This will be given up and the equipment moved to the Australian research center.

Plans for the cooperative arrangement were made by Dr. Dirk Brouwer, director of the Yale Observatory, Dr. Jan Schilt, director of the Rutherford Observatory at Columbia and Richard van der Riet Woolley, director of the Commonwealth Observatory, who is visiting the United States.

Yale and Columbia will install a 26-inch

photographic refractor telescope in the new observatory. The Australian government will construct the dome to house this instrument and will supply other equipment, including a 74-inch reflector telescope and a Schmidt-type telescope.

The astronomical research center is expected to be ready for use by Jan. 1, 1952.

Hindrance of observations by city lights and smoke from industrial plants in Johannesburg is one of the reasons for moving to a new location, Dr. Brouwer stated. Mt. Stromlo is in an area where industrial or residential development has been forbidden by act of the Australian Parliament.

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ENGINEERING

Silica Glass for Small High-Wattage Lamps

➤ THE only new development in glass making since glass melting began many years ago is a process now used in producing new silica glasses with properties approaching fused silica, the Illuminating Engineering Society was told in Pasadena, Calif.

These products, called Vycor brand 96% silica glasses, can be used to make high wattage incandescent lamps in small envelopes, W. W. Shaver of Corning Glass Works, Corning, N. Y., stated. Also, in germicidal lamps, they increase efficiency because they transmit a larger percentage of ultraviolet rays.

The first steps in making these alkali-borosilicate glasses, as they are also called, are conventional melting followed by blowing, pressing or drawing processes. But the products are turned out in oversized shapes.

After a heat treatment they are immersed in a dilute acid bath and soluble materials are leached out. In the heat treatment the glass separates into two phases, one of which is rich in boric oxide and acid soluble while the other is practically 96% silica.

New photochemical lamps, developed particularly to meet the operating conditions of modern whiteprint machines, were described at the same meeting by L. E. Barnes of Westinghouse Lamp Division, Bloomfield, N. J.

These new lamps have higher ultraviolet output and more uniform output because of reduced sensitivity to drafts. They have longer life and their life is practically independent of the number of times the lamps are turned on.

In these lamps the Corning Vycor glass is used, being cheaper than quartz and more efficient than glasses formerly employed. By means of a new electrode sealing process, the need of an exhaust tip is eliminated. The new glass permits a reduction in bulb diameter, thereby reducing sensitivity to drafts.

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IN SCIENCE

ZOOLOGY

Rare Birds at Bronx Zoo

➤ SOME of the rarest birds ever to come out of South America—including a long-wattled umbrella bird, an equatorial cock of the rock, and a series of brilliant-hued Andean humming birds—went on exhibition recently at the Bronx Zoo in New York.

They are part of a collection by Charles and Emy Cordier of the New York Zoological Society. Some of the humming birds, inhabitants of high reaches of the Andes Mountains in Ecuador, are believed never to have been exhibited alive before.

The rare long-wattled umbrella bird has a bright red throat pouch which blows up to more than a foot in length and four inches in diameter. When first put into a glass-fronted cage with a cousin the eastern umbrella bird, the new inmates immediately tried to fly through the plate glass. The cage had to be whitewashed until the birds learned the limits of their strange new world.

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AERONAUTICS

Automatic Parachute Opens at Proper Altitude

➤ A PARACHUTE that opens automatically at the proper distance from the ground, developed at the Wright-Patterson Air Force Base in Dayton, Ohio, promises to eliminate much of the hazard of dropping from speedy planes and high altitudes with open chutes.

The parachute "brain" contains a timer, which is set usually to permit an interval of five to seven seconds between release and opening. It contains also an aneroid element, such as used in barometers, set to open the chute at an elevation of 5,000 feet above the earth. The parachuter has a free-fall until this proper height above the earth is reached.

The parachute requires only that the pilot get out of the plane and pull a handle connected by cable to the automatic release. From there on, the automatic release takes over, opening the chute after the airman has fallen a safe distance. It prevents accidents that follow if a pilot fails to pull a hand ripcord at the proper time or if he is prevented by a blackout from pulling it at all.

The parachute itself is the same size as earlier types but is 30% lighter and its tearing strength has been increased 100% by a special rip-stop weave.

Science News Letter, September 2, 1950

DE FIELDS

MEDICINE

Warn against Overdose Of Ergot for Headache

➤ **ERGOT** is a "most potent and effective" drug for relieving migraine headaches but overdosing with it must be avoided, Drs. Marvin Fuchs and Lester S. Blumenthal, of George Washington University Medical School, Washington, D. C., warn in the *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* (Aug. 26).

They base their warning on two cases. In one "alarming symptoms," including massive vomiting, pain around the heart, palpitations, numb and cold extremities and blue lips and nails, developed 30 to 40 minutes after taking two tablets of cafergot. This is an ergot and caffeine preparation. The patient recovered, but he was unable to get out of bed for 24 hours because of prostration. This case is believed the first in which bad effects followed the use of cafergot.

The other case, in which the patient's heart was affected, is the first known report of such toxicity from another ergot preparation, dihydroergotamine.

Migraine headache sufferers are usually resistant to the harmful effects of ergot, the Washington physicians point out. However, they warn, migraine does not give immunity to ergot poisoning.

Malnutrition, from protein and vitamin lack, and high blood pressure even without detectable artery or kidney complications, are conditions which should make doctors extra cautious in giving ergot preparations, the Washington physicians state.

Science News Letter, September 2, 1950

MEDICINE

Vampire Bats Carry Rabies In Tropical Countries

➤ **VAMPIRE** bats, legendary terror of the tropics, now have another curse against their name. Like mad dogs and foxes in temperate zone countries, blood-sucking bats are transmitting rabies.

The modern-day fight against the vampires was described by Dr. James H. Steele, chief veterinarian of the U. S. Public Health Service's Communicable Disease Center at Atlanta, Ga., in a paper at the annual meeting of the American Veterinary Medical Association in Miami Beach, Fla.

Rabies is almost sure death to both man and animals unless serum is given before symptoms of the disease appear. In the United States, Dr. R. B. Phillips of Cordele, Ga., reported, cows are becoming more susceptible to rabies than dogs. In one sec-

tion of Georgia last year, he said, rabid foxes killed about 360 cows, horses and mules. Dogs, although highly susceptible to the dread disease, were protected by vaccination.

Another cattle disease called anaplasmosis, which is like malaria in humans, now costs U. S. farmers about \$5,000,000 a year, Dr. Paul L. Piercy of the University of Georgia told the convention.

Originally found only in the Deep South, anaplasmosis now has spread to half of the 48 states. It is carried by ticks, flies and mosquitoes, and may be transmitted by man by the use of unsterilized surgical instruments in dehorning or vaccinating cattle. Cows that recover from the disease may be carriers of it for the rest of their lives. No satisfactory treatment of the disease has yet been found.

Science News Letter, September 2, 1950

GENERAL SCIENCE

Direct Handling of Deferment Appeals

➤ **RESERVE** officers will soon be able to appeal directly to the Pentagon for deferment if they are in jobs they or their employers consider essential, Science Service learned.

The Army, Navy and Air Force are setting up an appeals mechanism headed by an officer of colonel or general rank in each service to which reserve officers subject to call may take their cases directly instead of going through channels.

The nation's top scientists see this as a step ahead in the task of conserving our vital supply of scientific personnel. They consider that the recently announced categories in which officers and men will be deferred from active duty was not sufficient. The time between being called up and reporting for duty is not long enough to get a proper decision at a local level.

Also, with decisions being made by local draft boards, the tendency is to put a man in service rather than to consider whether he would be more useful to the nation in his present civilian job. Until the appeals mechanism is set up, reserve officers must make their appeals through the chain of command where they are likely to be stymied.

The scientific world, however, does not consider the impending appeals mechanism enough. Scientists are still plugging for a scheme under which the entire scientific manpower picture of the nation will be assessed.

Scientists of draft age and in the reserves would then be assigned to the places in which they could do the nation's defense effort the most good, whether in uniform, in government laboratories, in private industry or in the colleges and universities.

Science News Letter, September 2, 1950

METALLURGY

Thorium, Atomic Energy Element, Found in India

➤ **THORIUM** occurs in the monazite sands in the Gaya district and in other parts of India, it is reported in a series of investigations on radioactive minerals of India by S. K. Nandi and D. N. Sen of the University College of Science and Technology in Calcutta, India.

Thorium is the only natural element besides uranium from which fissionable materials for the A-bomb can be made. Crystals of the thorium mineral occur in several places in India, associated with pitchblende, the usual ore of uranium, according to the Indian scientists.

The mineral is an ortho-phosphate of the rare element cerium, and contains 12% of thorium combined partly as phosphate and partly as silicate. A small fraction of a percent of uranium present in the monazite sand allowed the age of the mineral to be determined as 803 million years, and assigned it to the Pre-Cambrian geologic age.

The researches are published in the *JOURNAL OF SCIENTIFIC AND INDUSTRIAL RESEARCH* (June).

Science News Letter, September 2, 1950

AERONAUTICS

Nautical Miles Will Replace Statute Miles

➤ **KNOTS** and nautical miles will replace miles-per-hour and statute miles in aircraft communications in the United States after July 1, 1952, it was revealed recently by D. W. Rentzel, head of the U.S. Civil Aeronautics Administration, Washington, D.C.

This will be in accordance with the standards established by the International Civil Aviation Organization, of which the United States is one of the 50-odd members. It also will put civil aviation in step with the U.S. military forces which in 1946 adopted knots and nautical miles as standard for all aviation operations.

A nautical mile is 6080 feet, compared with 5280 feet in a statute mile. Basically, it is a sixtieth of a degree, or one minute, on the arc of a great circle of the earth. Knots express the number of nautical miles traveled in an hour. A speed of 20 knots means traveling at 20 nautical miles per hour. A speed of 91 miles per hour is the same as 79 knots.

The recommendation of the International Civil Aviation Organization relative to the world-wide adoption of knots and nautical miles is one of several steps taken by the group to promote international transportation and make aviation communications easier to understand by pilots from all parts of the world by the use of universal terms.

Science News Letter, September 2, 1950

CHEMISTRY-BOTANY

The Big Itch Bites the Dust

Deadly sprays are the weapons in an all-out attack against the terrible trio of poison ivy, oak and sumac. "Leaves of three, let it be" is still sound advice.

By SAM MATTHEWS

➤ DEADLY chemicals armed an all-out attack this summer against an innocent-looking green leaf whose unmistakable trademark is an intolerable itch.

The leaf belongs to the clan *Toxicodendron*—the terrible trio known as poison ivy, poison oak and poison sumac. In round figures, these three plants blistered half a million Americans this vacation season.

Their profusion in fields and woods, along fence rows, rock walls and hedges, in country lawns and city gardens, seems almost in outright defiance of the human race. For generations, men could do little about the pests but scratch in angry impotence. Now revengeful victims have weapons with which to fight back.

Three new chemicals have joined man's battle in the last decade: ammonium sulfamate, 2,4-D, 2,4,5-T. There are older killer compounds: ammonium thiocyanate, powdered borax, carbon disulfide, coal-tar and petroleum oils, sodium chlorate and sodium arsenate.

Sulfamate Most Effective

Ammonium sulfamate, widely marketed by du Pont under the trade name Ammate, is perhaps the most effective weapon yet developed against poison ivy. It begins to wilt the leaves within 24 hours, will kill the entire rootstock if properly applied. The U. S. Department of Agriculture recommends ammonium sulfamate as the best poison ivy killer to use in frequented areas such as school yards, playgrounds and picnic areas.

Originally developed as a wartime biological warfare agent, 2,4-D is one of the so-called "plant hormones." It is not a quick killer, nor is its similarly numbered cousin, 2,4,5-T.

Sprayed on poison ivy, at first these compounds seem to have little effect. The shiny green leaves take from three weeks to a month to completely die. These inexpensive chemicals are excellent killers, however, and are best for use in places where contact by humans or dogs is not normally expected.

Be careful with both ammonium sulfamate and 2,4-D. Ammate kills any plant it actually touches; 2,4-D, although it will not harm grassy growth, will ruin broad-leaved plants such as tomatoes, potatoes and many flowers if the wind carries the chemical into your garden—or your neighbor's. Be careful to wash out

your sprayer thoroughly after using these weed killers.

Spray in the morning of a windless, hot and humid day. Life processes in plants will be moving at top speed then. The chemicals will be absorbed quickly and will be carried to all parts of the plant, even though they originally hit only a few leaves of the vine.

Several Sprayings Needed

Some new growth must be expected after the first spraying. Two to three additional treatments will be required the first year, followed next spring by a mop-up campaign.

There is still no substitute, however, for quick recognition of the poison plants to keep your skin clear of *Toxicodendron*'s trademark. Pay heed to the old adage, "Leaves of three, let it be."

Poison ivy and poison oak grow as long, twisting root-vines, sometimes running just under the surface of the ground, sometimes climbing tree trunks, walls, even the sides of houses. If beneath the ground, the shoots appear as low, erect shrubs.

These two plants flourish everywhere—in deep woods where the soil moisture is plentiful or on dry, exposed hillsides. The compound leaves always grow in sets of three from the same point on the vine, appearing glossy green on top, lighter underneath. When the rootstock climbs above

ground, it sprouts hundreds of tiny aerial tendrils. In fall and winter, poison ivy and poison oak carry dull white berries.

Poison sumac is a coarse woody shrub or small tree. Like ordinary sumac, it touches the woods in fall with brilliant red-orange or russet. Poison sumac, however, grows only in wet, acid soil around swamps and bogs. Unless you spend your summer near such a place, there is little likelihood of running into it.

Once poisoned by these plants, there is no quick cure known. There are dozens of remedies offered. Most of them offer relief from itching, although individual sufferers react differently to different preparations. In all but the most severe cases, blisters will dry up and disappear by themselves in 10 days to two weeks.

Tannic Acid Treatment

The U. S. Public Health Service recommends a 10% alcoholic solution of tannic acid. Rub vigorously with gauze soaked in the solution until the tops of the blisters rub off. Repeat three or four times at six-hour intervals. This treatment will sting.

In any severe case of poisoning, self-treatment is not a good idea. The safest procedure always is to see your doctor.

The poisonous agent in the sap of poison ivy, oak and sumac is a substance known as urushiol. Its action on the skin is now recognized as a form of allergy. Individuals vary widely in reaction to it, but doctors believe there is no such thing as a completely immune person. You may never have been affected by poison ivy, and suddenly come down with a severe attack.



ITCH PRODUCERS—Leaves of poison sumac (left) are divided into odd-numbered series of leaflets, from seven to 13 in a group. Bright orange in spring, they turn dark green in summer, then red-orange or russet in the fall. Most poison ivy vines (right) develop tiny white blossoms in the spring.



DESTROYING PEST—Poison ivy should be sprayed three or four times during the summer.

Urushiol is so potent that as little as 1/60,000 of a grain of it (about 00000004 of an ounce), when dissolved in olive oil and rubbed on the skin, will cause mild poisoning.

Plants which carry this evil substance are not known in Europe. There are Asiatic sumacs, however, whose sap is highly poisonous. This sap has been used as a shellac.

A story is told of a zealous customs in-

pector who opened a heavy can brought in by a Chinese importer. The importer said the stuff was shellac, but the inspector said to himself, "A-ha, opium!" He took the sticky black substance to the laboratory, spread it over himself liberally while analyzing it, and for the next month was laid up with one of the worst cases of sumac poisoning on record.

Science News Letter, September 2, 1950

Resentment Causes Hives

➤ RESENTMENT is a cause of hives, it appears from studies of 30 patients reported by Drs. David T. Graham and Stewart Wolf of the New York Hospital and Cornell University Medical College (JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, Aug. 19).

The patients got attacks of hives when they felt they were being unjustly treated and could not fight back nor avoid the unfair situation.

"Taking a beating" (unjustly) is the way they described it, and their blood vessels behaved as they would if the patients had actually been receiving blows.

The doctors' studies showed that the hives resulted from extreme dilation of the small blood vessels in the skin which occurred as part of the patient's reactions to the situation.

Although these patients sometimes felt hatred of others or anxiety about various situations, it was always resentment that

brought on the attack of hives. In some cases of flushing of the skin in embarrassing social situations, questioning revealed that there was some resentment mixed in with the embarrassment.

The resentment was usually felt toward a wife, husband, parent or other close relative. The patient felt "There was nothing I could do," although the doctors often could see how the patient could have fought back or avoided the unjust treatment.

Science News Letter, September 2, 1950

PHYSICS

Arrangement Irregularities Govern Material Strength

➤ THE strength of materials may depend upon the irregularities in atomic arrangement in solids, it is believed in New Bruns-

wick, N. J., by scientists of Rutgers University.

In research work seeking new basic information dealing with the irregularities of atomic arrangement, they are using X-rays to produce more accurate and complete pictures of the irregularities than ever produced before, it is claimed.

The work is sponsored by the Office of Naval Research. The scientists on the project are Dr. Alfred J. Reis and Sigmund Weissman. Their work is based on long-known knowledge that the physical properties of metals, ceramics and other industrial materials must be intimately connected with the arrangement of atoms.

Science News Letter, August 19, 1950

On This Week's Cover

➤ TAILORS spend not only winter days but sweltering summer days cutting and fitting sleek, tailored overcoats—thick, asbestos-lined "overcoats" for steam turbines. For the turbines need overcoats no matter how hot the weather, to prevent loss of heat from the temperature steam that makes most of the nation's electrical power.

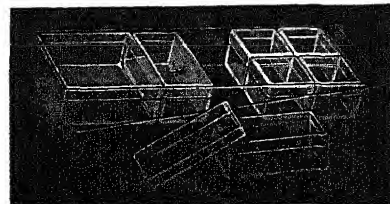
No diapa shape will do for a turbine. Even the curve of the cross-over pipe of the turbine must be smoothly jacketed as shown on this week's cover of SCIENCE NEWS LETTER. The "interlining" of the turbine's overcoat is a thick blanket of asbestos and glass fiber. Like a satin bedcover, the sections of "blanket" under the canvas are quilted and tufted to keep the stuffing from bunching or shifting. But turbine tailors sew with steel wire and tuft with steel washers.

In making some of the world's largest clothing, the Steam Division annually uses some 60 miles of wire "thread"; 7,500 square yards of asbestos cloth; and more than 64,000 pounds of glass fiber.

Science News Letter, September 2, 1950

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GENERAL SCIENCE

Giannini Sues Government

The Giannini Company has filed suit against the U. S. Government for compensation to Dr. Fermi for use of his patent on atomic energy processes.

► THE question of how far one individual may patent the laws of nature will probably be reopened in connection with the suit filed against the U. S. Government by the G. M. Giannini Co., of Pasadena, Calif., for compensation to Dr. Enrico Fermi for use of his patent on atomic energy processes.

The U. S. Patent Office, having granted the patent to Fermi and his co-workers in 1940, has no further jurisdiction over the matter. It is up to the Court of Claims to determine whether it has jurisdiction in the case, and, if so, whether Dr. Fermi should receive compensation for use of his process for non-military purposes, or whether his claims are too broad. The claims specified use of neutrons for production of radioactive isotopes two years before it was known that they would produce a chain reaction.

The patent which is the basis for the \$10,000,000 suit was issued July 2, 1940, on an application dated 1935. A similar patent was applied for in Italy in 1934. The inventors are listed as Enrico Fermi, Edoardo Amaldi, Bruno Pontecorve, Franco Rasetti and Emilio Segre of Rome, Italy, and it was assigned to the Giannini Co., at that time in New York City.

The patent states that it relates to production of isotopes by reaction with neutrons, especially for production of artificial radioactivity. It specifies use of low energy neutrons instead of charged particles to produce nuclear reactions, and mentions hydrogen, beryllium, carbon, silicon and lead as materials which will slow neutrons down to the energies needed. This is the description of the atomic pile, in which carbon, in the form of graphite bricks, controls the neutrons. Fermi's specification for producing neutrons is the same as that used today, a mixture of radon and beryllium.

The form of the atomic pile planned by Fermi, however, was made of paraffin or other material rich in hydrogen, or else a tank in which material to be irradiated was to be dissolved in water, either the usual kind or "heavy water." While this kind of pile has not been used on a large scale, experimental work has proved it to be efficient.

Fermi's idea of using so-called slow neutrons proved the key to the two successful processes for atomic energy, fission of uranium 235 and production of plutonium.

Science News Letter, September 2, 1950

GENERAL SCIENCE

Draft by Occupation

► A RADICAL new method of drafting men for the armed forces whereby they might be called up by occupation instead of by order number is being quietly pushed through Congress by the administration, Science Service has learned.

Under the new system, if the army wants 100 automobile mechanics, it can call them up directly instead of hoping to get them in a general draft.

The authority to do this is contained in a new bill presented August 22 to a subcommittee of the Senate Armed Services Committee. It provides that the President can order the registration and drafting of "professional, technical, scientific, specialist and other occupational categories."

It is the "and other categories" phrase under which the automobile mechanics—or cooks or truck drivers—could be drafted directly.

The new bill was presented to the subcommittee at a meeting which discussed the Gurney bill that would give the Presi-

dent the power to draft doctors and dentists. Various amendments to this bill to include the registration of all scientific personnel were presented but it looks now as though the Gurney bill will be confined to members of the healing arts professions. The new bill will take care of scientific personnel "and other categories."

Scientists are worried that the call-up of their colleagues under the new bill would be administered by the present Selective Service System which, they claim, does not have the competence to do the job, either on the national or local level. A top scientist, perhaps Dr. Vannevar Bush or Dr. Karl T. Compton, will shortly present to the President a proposal for a Scientific Selective Service Board to register both men and women with scientific skills and to call them up if necessary.

However, National Security Resources Board officials who wrote the new overall registration bill claim that authority to draft men by occupations would be taken away

from the Selective Service System under the language of the bill and placed in the hands of the President. It is possible that the President would designate the NSRB as the agency to handle this occupation draft.

Science News Letter, September 2, 1950

VETERINARY MEDICINE

Animal Diseases Which Attack Man Studied

► UNDULANT fever, known to be transmitted in unpasteurized milk, is also widely carried by the meat from hogs, cattle and goats which have brucellosis, it was reported in Miami Beach, Fla.

Research workers at Purdue University found brucellosis germs in hog carcasses kept three weeks in cold storage, the American Veterinary Medical Association was told.

The painful disease which the germs can cause in human beings is a serious occupational hazard of packing-house workers and farmers who butcher their own meat.

Brucellosis has been transmitted through the semen of an infected bull to susceptible heifers and cows by artificial insemination, Drs. C. A. Manthei, D. E. DeTray and E. R. Goode, Jr., of Beltsville Md., told the annual veterinarians convention.

Public health workers as well as veterinarians are attacking animal diseases which also strike at humans. These include brucellosis, rabies and Newcastle disease in poultry.

Scientists at the University of Maryland have found that the Newcastle disease virus is deadly in a wide variety of mammals such as hamsters, sheep, a calf and white mice. In Rhesus monkeys, an animal believed to closely approximate reactions in man, the virus produced paralysis and death.

The fact that more than a third of the meat eaten in this country has inadequate sanitary inspection points up the hazard from such diseases, Dr. H. G. Bailey of Savannah, Ga., told the convention. Only meat shipped across state lines now comes under federal inspection, he pointed out. The rest is subject only to checking by state or municipal health officers.

Science News Letter, September 2, 1950

● RADIO

Saturday, September 9, 3:15 p. m. EDST

"Adventures in Science" with Watson Davis, director of Science Service over Columbia Broadcasting System.

Mr. Davis will discuss the chemical advances as revealed at the Chicago meeting of the American Chemical Society and the National Chemical Exposition.

The Public's Way to Science

Science Service is the unique institution established in 1921 to take science to the people . . . to conduct, operate, and furnish press service for the collection, preparation, distribution, and sale of scientific matter and information, current events and fundamental conceptions or topics of interest to general readers, to newspapers, periodicals, journals, magazines, educational institutions, and government. Organized as a non-profit corporation, it has trustees nominated by the National Academy of Sciences, The National Research Council, the American Association for the Advancement of Science, the E. W. Scripps Estate and the Journalistic Profession.

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IN A DEMOCRACY LIKE OURS it is particularly important that people as a whole should so far as possible understand the aims and achievements of modern science, not only because of the value of such knowledge to themselves but because research directly or indirectly depends upon popular appreciation of its methods. The specialist is likewise a layman in every science except his own and he, too, needs to have new things explained to him in non-technical language. Scientific progress is so rapid and revolutionary these days that no one can keep up with it without some means of keeping in close contact with its new ideas and discoveries.

Thousands join in this great national movement dedicated to the development of science talent and sponsored by Science Service. About 15,000 clubs are organized in junior and senior high schools in every part of the United States and in 25 foreign countries to carry out hobbies, serious research and useful activities in science. Newspapers, museums, science teachers and professional scientists cooperate. Without charge, clubs are furnished with a handbook on science projects, lists of recommended books, free and low cost materials, cooperation on science fairs, etc.

SCIENCE TALENT SEARCH

The annual Science Talent Search for the Westinghouse Science Scholarships brings opportunity each year to students with special talent in science. In addition to the forty boys and girls who win five-day all-expense trips to the Nation's Capital and who compete for \$11,000 in Westinghouse Science Scholarships, many more win Honorable Mention—a recognition that helps them get scholarships to colleges, universities and

technical schools seeking able students. The Science Talent Search is extended in 23 states by state Science Talent Searches. It is an answer to a challenge to make potential scientific talent available for important tasks. Real ability for creative research is rare, and within a few years, boys and girls now in high schools must be ready to take the lead in scientific research.

RADIO

SCIENCE SERVICE has participated in radio continuously since the early days of broadcasting. Weekly programs include both the participation of guest scientists and science news talks.

BOOKS, ARTICLES, VISUAL AIDS

SCIENCE SERVICE edits and publishes books, prepares articles, produces film strips and other visual aids. Its collection of photographs is extensive.

INTERNATIONAL SERVICES

Cooperation is extended to newspapers, institutions and organizations in other countries. Through UNESCO and otherwise, scientific knowledge is shared with the peoples of the world.

LATIN-AMERICAN ACTIVITIES

Because of the demand from other American republics for scientific books, and the importance to health, industry, agriculture, etc., of the wide-spread distribution of such knowledge, Science Service, at the request of the Department of State of the United States of America, initiated in 1943 a program of aid to the publication of such translations.

NATIONAL SCIENCE FAIR

Newspapers, cooperating with Science Service, educators, scientific societies and industrialists, support local science fairs to which the public is invited. Secondary school students whose exhibits are judged best are selected to represent the cooperating newspaper's territory at the National Science Fair, conducted by Science Clubs of America. To each representative the solid gold and silver Finalist medal is awarded. Each has an opportunity to share more than \$1,000.00 in scientific equipment awards and partake in a 3-day scientific adventure. The second National Science Fair will culminate in St. Louis in May 1951.

BOTANY

NATURE
RAMBLINGS

Holly

➤ IT takes 18 years for a holly plantation to come into its best bearing. Many farmers, when their first child is born, set out holly cuttings in late August of that year, knowing that a profitable crop will come in just in time to meet college bills nearly 20 years later.

European holly, with the greenest leaves and reddest berries of nearly 300 species of the Yuletide trimming, is grown in favorable areas from the Virginia tidelands to the Pacific Northwest. Its market, although restricted largely to the month of December, is huge—so huge that those who simply go out and steal native American holly have all but wiped out this New World variety. By the torn bark and splintered ends of the branches can be seen the haste and destructiveness of its harvesting.

When it is grown as a cash crop the care of holly is exacting. In August, cuttings from top grade trees are planted in cold-frames for the winter. They must be kept moist to ensure rooting. Sometimes they are treated with expensive growth-regulating chemicals to make sure roots will grow from the cut branch.

The following spring the young plants are transferred to cultivated garden rows. They grow there for one to two years. Then they are transplanted again to holly plantations, where they are kept in carefully thinned rows.

The farmer must know plant genders, for holly grows as both female and male trees. About one tree in ten in the plantation must be male. These bear no berries, but produce the pollen without which the female plants cannot bear fruit.

Historically, holly is older than Christmas. In German forests it figured in ancient pagan celebrations marking the beginning of the sun's return from its southward retreat, bringing with it the promise of another spring.

Holly was a sacred shrub not only among the Druids; it was highly esteemed by the Romans as well. Holly wreaths were hung at weddings. Pliny states that holly trees were planted to protect property from lightning. Thus even before it came to be

a symbol of the Christmas spirit it was believed to enjoy the special favor of Jupiter, thunderbolt-wielding terror of the gods

How far back of antiquity these early beliefs about holly go there is no way of guessing. One hint of very early human association with holly was found in the refuse heaps under the stilt-supported houses of Switzerland's Stone Age lake-dwellers. Holly seeds and twigs are abundant there. It is possible that these ancient people used the bitter stuff of the holly leaf, called ilicin, as a medicine or a beverage.

Science News Letter, September 2, 1950

VETERINARY MEDICINE

BAL, Anti-Gas Drug, Saves
Dogs from Arsenic Poison

➤ A NEW antidote for arsenic poisoning of animals has been found in a wartime drug which would have been widely used by humans had poison gas attack ever come.

The drug is BAL, short for British Anti-Lewisite. Now it is being used to save the lives of horses and cattle accidentally poisoned on farms and ranches. Dr. George T. Edds of Texas A. & M. College told the American Veterinary Medical Association in Miami Beach, Fla.

BAL, Dr. Edds said, seems to combine with the atoms of arsenic, forming a new substance which is easily flushed from the animal system.

Hormone breakdown in cows after calves are born was reported by Dr. H. E. Kingman, Sr., of Cheyenne, Wyo., an authority on bovine obstetrics.

Although cows go through "childbirth without fear," he said, the nervous strain during delivery sometimes upsets the delicate glandular balance which controls the supply of hormones. Feeding the stricken mother through the veins helps save many cows which otherwise would die from calving disorders.

Veterinarians are still not winning their multi-million dollar game of hide-and-seek with livestock parasites. Dr. R. D. Turk of Texas A. & M. said worms and other parasites are a major problem on nearly all American farms and ranches.

Parasitic attack is often insidious—the animal is not sick, it eats well, but simply fails to gain weight. More than one species of parasite may be present, complicating enormously the problem of drug treatments.

Veterinarians and physicians working on the jig-saw puzzle of cancer are slowly building a large library of diseased animal tissue for research, the AVMA's annual convention was told.

The specimens go to a central collection point in Washington, the Registry of Veterinary Pathology, which is a branch of the Armed Forces Institute of Pathology. In an intricate automatic card indexing sys-

tem relationships between diseases are being studied statistically, in the never-ending search to answer the riddle of cancer.

Science News Letter, September 2, 1950

MILITARY DEFENSE

"SAM" Protects Uncle
From A-Bomb Planes

➤ UNCLE SAM has a namesake nephew upon whom he will rely for much of the protection he needs against planes carrying A-bombs. The nephew is "SAM," short for "surface-to-air missile."

"SAM" describes only one of the purposes of guided missiles. Artillery officers of all the services are now being trained in the use of both "SAM" and "SSM," surface-to-surface-missiles, according to the *ANTI-AIRCRAFT JOURNAL* (August).

"SAM" will not only protect Uncle against planes carrying A-bombs to our shores, but it will be used in the field, against planes attempting to strafe our troops.

"SSM" will be used by our field artillery against enemy troops, their equipment and positions.

In addition to "SAM" and "SSM," there are "AAM," air-to-air-missiles, "AUM," air-to-underwater-missiles, "UAM," underwater-to-air-missiles; "ASM," air-to-surface-missiles; "SUM," surface-to-underwater-missiles, and "USM," underwater-to-surface-missiles.

Regular officers of the Army, Navy, Marine Corps and Air Force with the necessary qualifications are being urged to apply for a 37-week course in guided missiles.

Science News Letter, September 2, 1950

ENGINEERING

Rice Blasting Removes
Engine Carbon

➤ CARBON in combustion chambers of automobile engines is quickly removed by a blast of rice without taking off the cylinder head. The spark plug opening is used to reach the insides with a new device developed in Lansing, Mich., by the Oldsmobile division of General Motors.

The device is called a head-on carbon blaster. It is a cylindrical affair with a double-hose connection to the engine. It sends high-pressure air and rice into the combustion chamber through a nozzle at the end of one hose. Used rice and carbon flakes are sucked out through the other.

The operator works the nozzle tip up and down inside the chamber, at the same time rotating it to blast all parts of the cylinder wall. The rice under pressure chips off the carbon and thoroughly cleans the surface. A good cleaning requires less than five minutes per cylinder.

Science News Letter, September 2, 1950

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AMERICAN POLYDESMOID MILLIPEDES OF THE GENUS *SIGMORIA*, WITH NOTES ON DISTRIBUTION—Richard L. Hoffman—*American Museum of Natural History*, 7 p., paper, 25 cents.

THE AMSTERDAM NATURALIST, Vol. I, No. 1: Bulletin of the Zoological Museum Amsterdam—H. Engel and J. J. Hoedeman, Eds.—*De Regenboog*, monthly, 33 p., illus., \$2.15 per year. A periodical containing reports on Dutch biological activities in English.

THE BASIS OF A DEVELOPMENT PROGRAM FOR COLOMBIA: A Report of a Mission—*International Bank for Reconstruction and Development*, 76 p., illus., paper, 50 cents. A summary of a more detailed report of Colombia's economic potentialities. Dr. Lauchlin Currie headed the mission.

BIG BOOK OF SCIENCE FICTION—Groff Conklin, Ed.—*Crown*, 545 p., \$3.00. Thirty-two stories of science to come, atomic power, interstellar space, thought transfer and four dimensional adventures. Among the authors included are Lewis Padgett, Waldemar Kaempffert, Ray Bradbury and Murray Leinster.

BIOLOGY OF DROSOPHILA—M. Demerec, Ed.—*Wiley*, 632 p., illus., \$10.00. The anatomy, histology and development of the vinegar fly so widely used in laboratories.

THE DEVELOPMENT OF A POLICY FOR INDUSTRIAL PEACE IN ATOMIC ENERGY—Donald B. Straus—*National Planning Association*, 104 p., paper, \$1.00. The author discusses labor problems and labor relations in the atomic energy industry.

EDUCATION FOR A LONG AND USEFUL LIFE—Homer Kempfer—*Gov't Printing Office*, 32 p., illus., paper, 20 cents. A bulletin primarily concerned with the problems of education for the aging.

ESSENTIALS OF MEDICINE: The Basis of Nursing Care—Charles Phillips Emerson, Jr. and Jane Elizabeth Taylor—*Lippincott*, 16th ed., 815 p., illus., \$4.00. A basic handbook brought up-to-date.

THE FIRST ANESTHETIC: The Story of Crawford Long—Frank Kells Boland—*University of Georgia Press*, 160 p., illus., \$3.00. The author writes a biography of the man he believes first used a surgical anesthesia.

THE FLOWER ARRANGEMENT CALENDAR 1951—Helen Van Pelt Wilson—*Barrows*, approx. 106 p., illus., paper, \$1.00. A record book for day by day engagements. Well illustrated with black and white floral arrangements.

THE GENERA COLIBRI, ANTHRACOTHORAX, KLAIS, LOPHORNIS, AND CHLORESTES: Studies of Peruvian Birds. No. 57—John T. Zimmer—*American Museum of Natural History*, 28 p., paper, 25 cents. A brief report.

A NEW *SIGANUS* FROM THE GREAT BARRIER REEF, AUSTRALIA—Otis Barton—*American Museum of Natural History*, 2 p., paper, 25 cents. A brief description of a coral reef fish.

NEW TRINIDAD MYRMICINAE, WITH A NOTE ON *BASICEROS* SCHULZ (HYMENOPTERA, FORMICIDAE)—Neal A. Weber—*American Museum of Natural History*, 6 p., illus., paper, 25

cents. A brief report on the finding of some archaic ants in the British West Indies.

NUCLEAR PHYSICS: A Textbook—Francis Bitter—*Addison-Wesley*, 200 p., illus., \$5.50. A textbook intended for students who have had a course in atomic theory in addition to the usual introductory physics course (Due to typographical error, price incorrectly listed *SNL*, Aug. 26, p. 143).

PHOTOGRAPHY IN ASTRONOMY—E. W. H. Selwyn—*Eastman Kodak*, 112 p., illus., \$2.75. An introduction to astronomical photography.

PHYSICAL CHEMISTRY FOR PREMEDICAL STUDENTS—John Page Amsden—*McGraw-Hill*, 2nd ed., 317 p., illus., \$4.25. A college text brought up-to-date.

PRINCIPLES OF COLOR SENSITOMETRY—C. F. J. Overhage, Ed.—*Society of Motion Picture and Television Engineers*, 72 p., illus., paper, \$1.00. A basic text.

PROCEEDINGS VOLUME OF THE GEOLOGICAL SOCIETY OF AMERICA FOR 1949—*Geological Society of America*, 274 p., illus., paper, \$1.50. Contains the proceedings of the annual meeting, reports of memorials and various committees of the Society.

PROCESS AND UNREALITY: A Criticism of Method in Whitehead's Philosophy—Harry Kohlsaat Wells—*King's Crown Press*, 211 p., \$3.00. A discussion of the interrelations of Whitehead's natural philosophy and speculative system.

THE TRUTH ABOUT YOUR EYES—Derrick Vail—*Farrar, Straus*, 180 p., \$2.50. A discussion of human eyes and how to protect them. For the layman.

VARIATION AND EVOLUTION IN PLANTS—G. Ledyard Stebbins, Jr.—*Columbia University Press*, 643 p., illus., \$8.00. A general account of some of our latest findings in plant evolution.

Science News Letter, September 2, 1950

BACTERIOLOGY

Bacteria, Like Body Cells, Divide by Mitosis

➤ BACTERIA, one-celled microscopic organisms that can be both friend and foe to man, apparently divide by the same complex process, called mitosis, that human cells go through in dividing to make more of their number.

What is believed "the first clearcut evidence for mitosis in bacteria" was presented by Drs. Edward D. DeLamater and Stuart Mudd of Philadelphia at the Fifth International Congress of Microbiology in Rio De Janeiro.

The meaning of this fundamental discovery in terms of practical application cannot well be foreseen at present.

One-celled animals, such as amoebae and paramoecia, are known to divide by the process of mitosis. Cells of larger plants, as well as larger animals, also undergo mitosis. But until now the nucleus of a

one-celled plant has never been shown to do this. In fact, it is only within recent years that scientists were at all sure bacteria even had nuclei.

Chromosomes, at first elongated into delicate beaded threads and later shortened, condensed and thickened, were seen by the Philadelphia scientists in the nucleus of a microorganism called *Bacillus megatherium*.

At the metaphase stage of mitosis, the chromosomes were seen as two dense round bodies and a bar, giving a chromosomal number of three. Later they again appeared in beaded threads.

New techniques for staining and fixing the bacterial cells, including a quick freezing process, enabled the scientists to see the chromosomes and watch their behavior through the stages of mitosis.

Science News Letter, September 2, 1950

AGRICULTURE

Enough Fertilizer For Entire World

➤ WITHOUT fertilizer, the world would be a lot hungrier than it is. But this summer, the Food and Agriculture Organization of the United Nations reports, a vital postwar corner was turned. A record amount of fertilizer is being produced—enough, for the first time since World War II, to satisfy world demand.

For the fiscal year ending June 30, nearly 13,000,000 metric tons of fertilizer was produced, an all-time record. Russia was the only major country not included in the FAO statistics.

In the coming year—barring effects of the Korean conflict—FAO commodity experts predict fertilizer output and consumption will go up another seven percent. "Because countries can now plan crop production programs on a broader base of available fertilizer supply, their agronomic needs can be better satisfied," the report states. In terms of a hungry world can better understand, the outlook for more food is good.

Science News Letter, September 2, 1950

A LOWER COST WAY TO TRAVEL

Life at sea—on a freighter—is a wonderful world of its own. True, there's none of the plush of the floating hotels. Neither are there crowded decks, bustling dining rooms, or unwanted noise.

Instead, you are one of the family. You get privileges impossible on a liner. You dine with the ship's officers, make the ship your own, and often steam into ports the liners never enter.

And class for class of accommodations, freighters charge less.

"Travel Routes Around the World" names the lines (hundreds of them), tells where they go, what they charge, how long they take, etc. Then for comparison, all passenger liners are also described.

"Travel Routes" is probably the most popular travel guide published. Travelers, travel agents, newspapers, magazines, American consulates—all recommend it.

\$1 brings you this jam-packed 50,000 word directory, plus (1) "Facts to Know About Choosing a Ship, a Cabin, Tipping, etc." (2) "Fun, Relaxation, and Marvelous Food—the Story of Life on a Passenger-Carrying Freighter."

Money back guarantee, of course. Simply print name & address on sheet of paper, write "Send your NEW Travel Kit," and mail with \$1 bill to Harlan Publications, 2 Sea Blvd., Greenlawn, Long Island, New York.

• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., Washington 6, D. C. and ask for Gadget Bulletin 532. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

⚙️ **HEATING ELEMENT**, to keep automobile batteries and others of the lead-acid type warm during cold weather, is an acid-resistant, electrically-energized unit which is submerged in the electrolyte. Electric energy is from an outside source. A thermostat responsive to the temperature of the electrolyte controls the heating.

Science News Letter, September 2, 1950

⚙️ **BICYCLE GEARSHIFT** which can be installed in practically any of the present models is a three-speed device by which the rider may shift to low, medium or high gear ratio by means of a lever on the right handlebar. It replaces the rear axle and sprocket wheel.

Science News Letter, September 2, 1950

⚙️ **ELECTRIC STYLUS**, fountain-pen size and designed to produce clean and clear-cut lines on wax-type stencils, operates on ordinary household current and delivers 7,200 strokes a minute. It can be used for glass writing and etching by the addition of an available diamond point.

Science News Letter, September 2, 1950

⚙️ **MIDGET STAPLER**, shown in the picture, although only pocket-sized, can be used to fasten up to 20 sheets of paper together. When a latch at the rear is pressed,



the stapler opens for easy refilling. It comes in a plastic box with a transparent hinged top.

Science News Letter, September 2, 1950

⚙️ **PLATINUM-TIPPED BURETTE** for the chemist is designed to deliver drops of approximately 0.01 millimeter. Burettes are glass rod containers with stopcocks and are used to add reagents drop by drop in chemical analysis. The platinum-alloy

stem of this micro-burette is sealed in a glass tip which is removed for cleaning.

Science News Letter, September 2, 1950

⚙️ **LITTER PICKER** for clearing lawns and parks, able to pick up cigarette butts as well as scraps of paper, is an aluminum cane with a pick-up head having a dozen or more sharp prongs. A perforated plate, through which the prongs pass, clears the litter by a push on the handle of the cane.

Science News Letter, September 2, 1950

⚙️ **LAWN SPREADER** for grass seed or fertilizer recently patented, is a bucket-like container worn on the front of the user with a hand-operated crank on the side to rotate an inside blade. Materials in the hopper are kept agitated and are forced by the blade out through openings.

Science News Letter, September 2, 1950

⚙️ **ZIRCONIUM ARC LAMP**, for use with microscopes either for direct viewing or obtaining micrographic photographs, provides a uniform, brilliant point source of light of low temperature in contrast with the flicker and heat of the carbon arc. The light spot can be varied in size by focusing adjustment.

Science News Letter, September 2, 1950

Do You Know?

A person does not have to be able to *smell* in order to taste.

Regulating the sulfur content of *smoke* reduces its damaging power.

Two dishes of *ice cream* make a satisfactory reducing lunch for a physically active man.

Refined granulated *sugar* is chemically the same whether it comes from sugar cane or sugar beets.

Brush growing along railroads is now being killed by chemical *sprays* from specially equipped spray cars on the tracks.

Spiders can go without food for months it is claimed, this fact enables them to live during the winter when insects for food may be unavailable.

Meat tenderness depends upon the amount of connective tissue and muscle plasma; the tenderest meat contains the least connective tissue and the most muscle plasma.

3 EXPERIMENTAL KITS

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● **STAINLESS STEEL**—6 specimens show some of the reasons why stainless steel is known as the "jewel" of the steel industry. 50c

● **POLYETHYLENE PLASTIC**—one of the newest of the thermoplastics . . . 7 specimens, including a 2 oz. measuring cup, demonstrate home and commercial uses of this unique plastic. 50c

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SEPTEMBER 9, 1950

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



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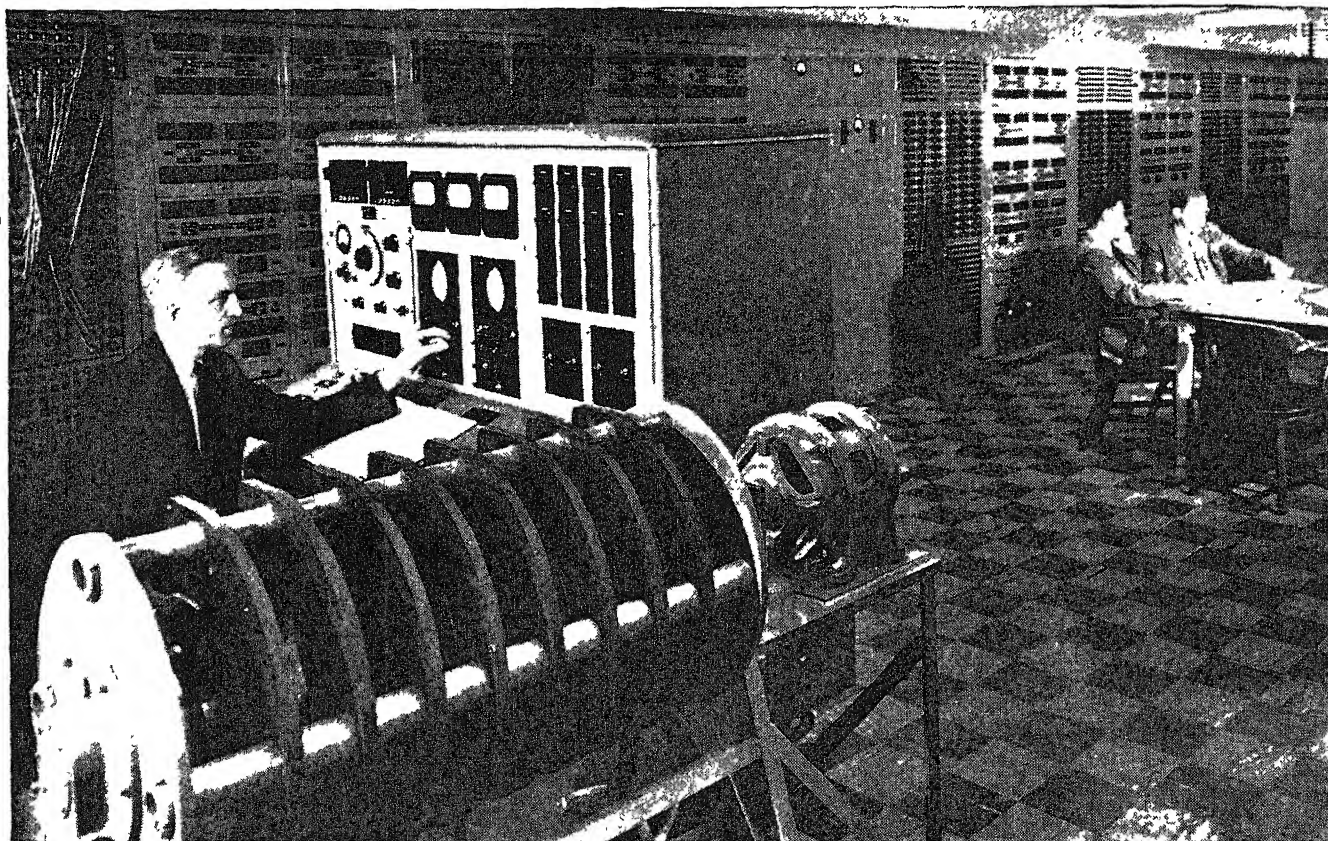
Hydrogen Spectacle

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A SCIENCE SERVICE PUBLICATION

A YEAR

VOL. 58 NO. 11 PAGES 161-176



New Type Computer *Solves Problems without Arithmetic*

What will be the performance of a jet plane in flight when subjected to various disturbances? That's a problem to tax the most brilliant mathematician. Yet here comes a machine . . . that does the work of a "brain cell" . . . that's ready, willing and able to solve the problem, quickly . . . accurately.

This newly developed "brain cell", called the "Anacom", substitutes voltages and currents for numbers that are fed into digital-type computers . . . has solved 43 various types of engineering problems in addition to mathematical problems not arising directly from physical systems.

In operation, the "Anacom" produces an electrical "imitation" of mechanical forces. Resulting voltages representing stress, motion and similar factors appear as lines on an oscilloscope screen. These lines can be measured accurately and translated to terms of the product under study.

The "Anacom" is one of the more complex developments of Westinghouse to facilitate research, product developments and quality control. Its development is typical of the depth to which Westinghouse will probe in its constant endeavor to look ahead . . . to keep ahead . . . to live up to its promise . . .

YOU CAN BE SURE..IF IT'S *Westinghouse*

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ENGINEERING

Electricity via Channel

The European continent could transmit power to the British Isles through a submarine cable under the channel.

➤ **ELECTRIC** power could be transmitted from the European continent to the British Isles through a submarine cable under the Channel carrying high voltage direct current, Sir Harold Hartley, British power and electricity authority, declared in his presidential address before the British Association for the Advancement of Science in Birmingham, Eng.

Such a linking of the continental and British power systems would give a better balance between seasonal and other demands, Sir Harold declared. Direct current transmission of high voltage current has now passed the experimental stage, he said, and is waiting for development.

Recalling the more ambitious schemes of past years for a tunnel under the channel, the proposed power link could be of 250,000 kilowatt capacity and would then give both sides the equivalent of a large modern generating station as stand-by plant.

Looking farther into the future, the BAAS president declared that a way of converting the free energy of carbon oxidation (burning) directly into electricity is still one of the distant goals of research, although a young German doctor, named Mayer, as early as 1842 pointed out the inefficiency of the steam engine and the need of obtaining electricity by chemical means.

Due to the development of automatic controls and precision techniques that consume almost negligible quantities of current, Sir Harold predicted that such modern robots or automechanisms will become substitutes for the drudgery of the human brain.

"In the future one of the indexes of economic progress," he said, "should be, not the energy used per worker, but the output of goods and services per horsepower employed."

The problems that the world faces, as listed by Sir Harold, are:

The growing strain of increasing population.

The malnutrition and the endemic sickness of perhaps half the world.

The inequalities between the more forward and the backward peoples.

The gradual depletion of resources and their unequal distribution.

The human problem of changing the way of life and the outlook of many millions.

"These problems are the challenge to the science and engineering of our time," Sir Harold told the British scientists. "Only

they can solve them—if allowed, and if men's minds are bent on quest of plenty not on quest of power. The orderly solution of these problems must depend on a knowledge of conditions and the needs of each country, on a survey of its natural resources, its human geography, its economic structure and its capacity to produce and consume."

Science News Letter, September 9, 1950

ENGINEERING

Hot Air Distributed By New Ceiling Device

➤ **WIDE** distribution of heated air, in a factory, garage or store, is provided with a new ceiling or wall heater with diffusers containing both horizontal and vertical blades to direct the heat where wanted.

It is a product of the Trane Company of La Crosse, Wis., and is made in two types. One is called "Louver Cone" and the other "Louver Fin." They are flexible ac-

cessories for the horizontal propeller and vertical projection types of steam and hot water heating units.

These new heat distributors are designed to solve diffusion on the job by simple adjustments which can be made by the fingers without use of tools. The flow of heated air can be sent in almost any direction where needed in many different patterns.

The Louver Cone diffuser fits projection type heaters often seen in high-ceiling factory rooms, warehouses and drug stores. Projection type heaters are generally used to recapture the heated air that has collected near the ceiling and drive it to near the floor where needed.

The Louver Fin diffuser attaches to horizontal type heaters which are usually placed on the walls of the room. It circulates the heated air horizontally. This new type has seven horizontal and 56 vertical blades, each adjustable to send the heated air in various directions.

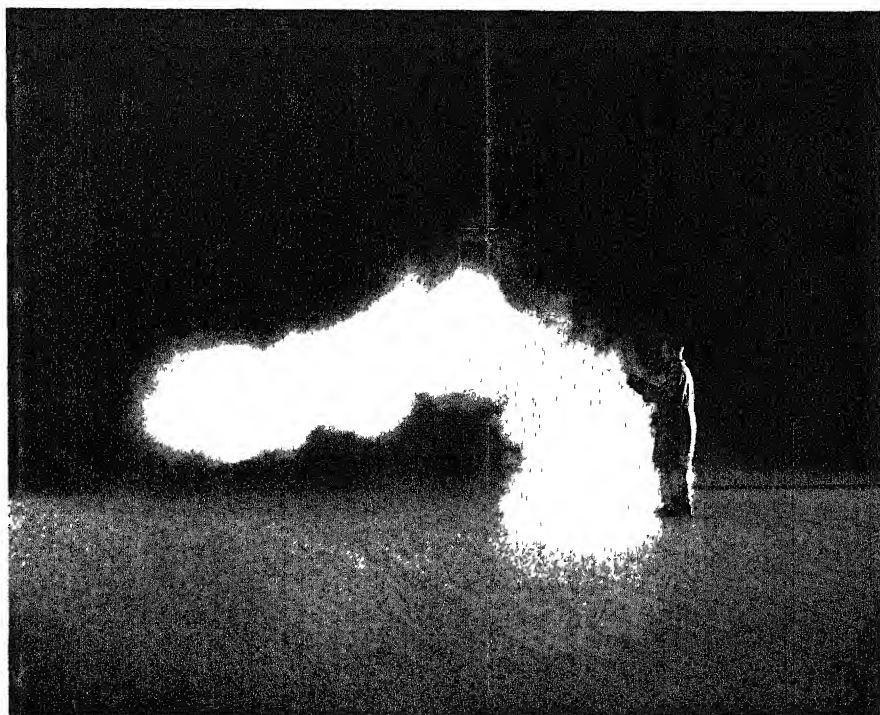
Science News Letter, September 9, 1950

PSYCHOLOGY

Voice, Gestures Express Emotions without Words

➤ **EVEN** if no words are used, emotions can be expressed through the tone of voice, gestures and other non-verbal methods of expression.

Wire recordings of interviews conducted



HALF AND HALF—With half its blades straightened and half turned to the left, the diffuser can direct air from a unit heater to blanket a doorway and cover a counter. This is a typical store use.

entirely in numbers, by persons counting to each other, were made in an experiment at Stanford University in California. Those taking part in the interviews made independent descriptions of what took place in emotional exchange and a group of observers also made descriptions of the emotional interchange.

Psychologists later were successful in matching the descriptions to the recordings.

Purpose of the experiment was to de-

velop a method for teaching students preparing to be specialists in mental sickness how to pay attention to the emotions expressed by a patient in his tone of voice and gestures. The scheme of using numbers in training situations works, reports Dr. Clare Wright Thompson, of the University of California Medical School, and Dr. Katherine Bradway of Stanford in the *JOURNAL OF CONSULTING PSYCHOLOGY* (Aug.).

Science News Letter, September 9, 1950

tion Chief Jerome Namias said that it was a difficult one to make. Events bore him out.

Mr. Namias expected strong west winds from the Pacific in the upper atmosphere to bring the warm, dry weather he had predicted to the East. At the time, however, he thought there was a possibility that tropical air from the Atlantic would upset his forecast. It did, meeting the winds from the Pacific and causing a great deal of rain.

Science News Letter, September 9, 1950

PSYCHOLOGY

Psychology in Politics

➤ **PSYCHOLOGICAL** knowledge and insight are most urgently required to solve the political problems that at the present time are the most pressing of all those that beset humanity, Dr. J. C. Flugel, psychologist of London's University College, told the British Association for the Advancement of Science in Birmingham, England, in his presidential address to the psychological section.

Politicians have for the most part shown little inclination to avail themselves of such knowledge as the psychologists possess, Dr. Flugel charged. They have not encouraged psychological research on a scale commensurate with the immense issues at stake.

Racial or national prejudices of a very harmful sort can in some cases be modified by psychological means, Dr. Flugel said.

From psychoanalysis, Dr. Flugel explained, it is now realized that we divide our attitude so that different persons or groups tend to be considered as crudely "good" or "bad." We project our own faults or those of our group and attribute them to others, he said, sometimes with a pathological intensity and disregard of reality which are comparable to those of the individual paranoid.

Individual conscience and judgment give way in favor of a childish and irresponsible idealization of the group or its leader and

everything they stand for, Dr. Flugel observed.

Hope that the world can cure itself exists in the realization of such facts of human behavior as worked out by the social psychologists and the cultural anthropologists. Dr. Flugel felt they could be made as effective in the statesmen's councils as they are in the nurseries.

Science News Letter, September 9, 1950

METEOROLOGY

Warm September Forecast For East and West

➤ A **WARMER**-than-normal September west of the Continental Divide and east of the Appalachians was forecast by the Weather Bureau. The Extended Forecast Section says that the Southwest and New England can expect the greatest departures from normal.

The central regions of the country can expect an average month so far as temperature is concerned.

The country is divided against itself so far as the prediction for rain is concerned. Subnormal rainfall in the West was predicted, but abundant rainfall in the East.

Cool, wet weather in the East during August did not jibe with the Weather Bureau's Aug. 1 30-day prediction. At the time it was made, Extended Forecast Sec-

SCIENCE NEWS LETTER

VOL. 58 SEPTEMBER 9, 1950 No. 11

41,919 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by **SCIENCE SERVICE, Inc.**, 1719 N. St., N. W. Washington 6, D. C., North 2255 Edited by **WATSON DAVIS**

Subscription rates, 1 yr., \$5.50, 2 yrs., \$10.00, 3 yrs., \$14.50, single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in *Readers' Guide to Periodical Literature*, *Abridged Guide*, and the *Engineering Index*.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N. Y. C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago, State 4439.

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Question Box

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On what day is the British labor output lowest? p. 169.

What kind of music does a he-man like? p. 168.

ZOOLOGY

What is the lobster's hidden talent? p. 174.

Photographs: Cover, Stewart Sharpless and W. W. Morgan, Yerkes Observatory, University of Chicago; p. 163, Hedrich-Blessing Studio; p. 165, Brookhaven National Laboratory; p. 167, Building Research Station, England; p. 170, 171, Dr. Walter C. Lowdermilk.

CHEMISTRY

Tires from Trees

Waste from spruce wood may be the material from which tomorrow's synthetic rubber will be made. This rubber may be superior to the synthetic rubber now in use.

➤ RAW material for tomorrow's synthetic rubber can be obtained from waste from the manufacture of paper from spruce wood, the American Chemical Society was told in Chicago.

This new rubber-making chemical is called PADMS, which is short for para alpha dimethyl styrene. It can replace the usual styrene that combines with butadiene to make GR-S synthetic rubber, the sort now in largest production. Dr. K. A. Kobe and Dr. R. T. Romans of the University of Texas made the report to the chemists.

Now styrene is in very short supply because of the expanded synthetic rubber program and because it is widely used in new synthetic chemical processes. It is made from benzene, obtained from oil or natural gas, and this is the mother material of so many other essential chemical products.

From the by-product of sulfite paper pulp, which is not only waste but a nuisance, chemists can obtain para-cymene which is then converted into PADMS by a process known as catalytic dehydrogenation.

The synthetic rubber made with the kind

of styrene from paper manufacture may even produce better synthetic rubber than the styrene now used. A few experimental batches of synthetic rubber were made with PADMS produced from terpenes by the turpentine or naval stores industry. In the few tires tested, there was a hint that the rubber might be superior to the kind now manufactured, but much larger pilot plant manufacture and extensive road tests of the tires made will be necessary before the scientists can be sure. There is confidence that the new rubber will be just as good as the present synthetic sort.

The paper pulp industry is expected to be willing to install the necessary recovery equipment for the cymene by-product if it would be utilized in large amount by the synthetic rubber industry. And the synthetic rubber plants would be reluctant to convert to the paper pulp raw material unless large supplies were assured.

Synthetic rubber production of the GR-S variety is now above the 400,000-ton-per-year mark due to the war situation and it is expected to increase in coming months.

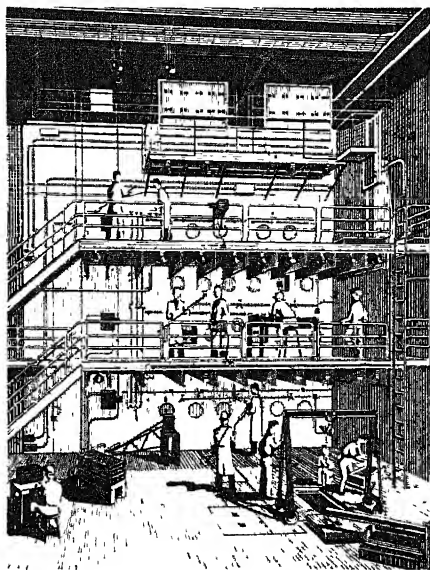
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the infinite out by treating some of these problems in an algebraic way. The algebraic approach provides simpler methods of solution for many practical problems ranging from the design of electrical circuits to gun sights.

Probability, which is basic not alone to gambling but to all human activity, is being put upon a firm mathematical basis and not left to plausible conjectures and paradoxes.

In the control of quality, so important to manufacturing production, mathematics has made recent and important contributions. Statistics are being used to tell manufacturers how often to pick a sample in connection with routine machine production.

For example, if a screw part is being made by an automatic machine it is wasteful to test each part produced to see whether it meets specifications. The trick is to make a test at infrequent intervals while the output is running true to specifications, but to increase the frequency of tests as soon as any divergence from specifications is noted. In this way it is quickly determined whether the divergence is a random fluctuation or whether the machine is really getting out of adjustment.



SCIENTISTS AT WORK—Artist's conception of how scientific experiments will be conducted on the west face of the Brookhaven reactor. Substances are introduced through the round ports or openings in the concrete shield for bombardment by neutrons inside the reactor. The bombardment makes the atoms of most elements radioactive. Beams of neutrons may also be let out of the reactor for studies of neutrons themselves, or for irradiation of various substances including plant and animal cells.

MATHEMATICS

From Now On: Math

Mathematics will continue to be vital in the sciences while new application of it in industrial production is expected.

By WATSON DAVIS

Twenty-fourth in a series of glances forward into science.

➤ MATHEMATICS is called both the queen of the sciences and the handmaiden of technology. Repeatedly in the long upward march of scientific progress, mathematical formulations and theories have led the way to great physical and biological developments.

The atomic bomb—both the A and H varieties—were first built in the formulas of the mathematical physicists. From the standpoint of engineering and technology, mathematics in its various ramifications is a very necessary tool, often creative of new ideas and new applications.

Mathematics as a science is still young and growing. It is by no means static. In fact, several hundred periodicals are

published throughout the world, devoted in whole or in part to mathematical research.

The scientists who work with paper and pencil have new and challenging problems and applications.

One of the plagues in mathematics, as in ordinary life, is in the fact that many problems do not seem to have a solution; that is, they are indeterminate. It used to be thought that everything could be resolved in some way or other if one were only ingenious enough, but it is now known that this is not true, because problems have been found which can be shown to be undecidable.

One thing that the mathematicians have been doing is to tackle analysis which is concerned with infinite processes, and turn it into algebra, which is concerned with finite processes. The new methods drop

Mathematics tells how frequently tests should be made so as, on the one hand, to avoid unnecessary testing when things are running smoothly, while on the other hand, to avoid making many defective parts by quickly sensing when things start to go wrong.

A real revolution in computing has been started by the introduction of automatic, high speed, computing devices, the so-called mechanical or electronic brains. This is opening new realms of mathematics. Not only will such computers speed up computations which are now done by slower, more tedious, methods, but they will make it possible to carry out computations which are too long to undertake by previous methods. The way in which mathematicians are trained in the future will be changed by the availability of these large computers.

The matter of mathematical tables may be vastly changed, because these machines may find it simpler and quicker to compute a particular value when needed rather than to look it up in a table. If the value

can be computed in less time and at less cost whenever it is needed, the machine will obviate the necessity of elaborate and costly table of values seldom required.

For the future, there may be expected:

A. Advances in pure mathematics either in filling gaps in our present knowledge or in the exploration of new fields.

B. Mathematicians will continue to explore the factors and relationships within the hearts of atoms, the living cell, the causes of diseases and the technicalities of engineering and production, with the likelihood of penetrating some of these mysteries.

C. While a more intensive development of mathematical research in the most advanced fields will take place, a new development in the application of mathematics to problems of production in industry is expected.

D. Scientists in almost every field will need to have a basic knowledge of mathematics and its power as an aid to scientific research.

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ASTRONOMY

Eclipse Thought Bad Omen

The path of the eclipse, beginning and ending in the western hemisphere, will be in the eastern hemisphere most of the time.

➤ MOST of the people in Korea, both North and South Koreans, consider the partial eclipse of the sun that will be visible there next Tuesday, Sept. 12, a bad omen, a thing of evil.

GI's busy slugging it out with the Communist armies will have little time to watch the moon blot out part of the sun's bright disk.

Both the total and partial phases of the eclipse can be seen only from the eastern hemisphere most of the time, although the path of totality begins and ends in the western hemisphere.

The partial eclipse will be visible over most of Siberia, northern China, Korea, Japan, Alaska, the Hawaiian islands and wide reaches of the Pacific.

The path of the total eclipse, that is where the sun will be completely blacked out by the moon, is nearly north-south for most of the way. It sweeps down on mainly uninhabited areas, starting near the north pole and going down to the central north Pacific, ending at 35 degrees latitude, about on a line with San Francisco.

Attu and Agattu islands, at the tip of the Aleutian chain, lie in the path of totality. Ten government scientists have set up a radio astronomy laboratory on Attu for viewing the eclipse. Using radar an-

tenna instead of optical instruments, they will view the sun's eclipse. At their position, astronomers calculate that totality will last one minute and 13 seconds.

This is only the second eclipse that has been studied with war-developed radar-like instruments, the other one being on May 20, 1947.

Just in case the weather is clear, however, these radio-wave specialists have taken along a 10-inch telescope with which they hope to be able to view the bright halo of the corona around a darkened sun.

Even if the sun is not visible to the naked eye, the measurements that the scientific world is awaiting can be made. For the sun gives off radiation that we can not see. Great streams of electrons, shot off from the sun, produce auroras when they strike the earth's atmospheric shell, play havoc with radio communications and appear to have an effect on the weather.

To learn more about the physics of the sun, the government scientists will train radio radiation-detecting instruments on it, using the moon as a knife edge to cut off the radiation. They will make their measurements at four different radio wavelengths.

As the moon slices in front of the sun, it will cut down on these different radiations

just the way that it does on the visible ones. By accurately timing the disappearance of each of these wavelengths the physicists will be able to learn the true size of the sun, not just the size of the part that is visible.

Scientists hope also to be able to get some idea of the contribution of sunspots, great whirling turbulences seen on the sun's surface, to the total radiation of the sun. When sunspots appear on the sun, hours later radio communications on earth will be affected. There also seems to be an increase in the intensity of the bombardment of the earth by cosmic rays after sunspots appear on the sun. Further verification of the recently proved direct travel of hydrogen atoms from the sun to the earth (See story below) is expected from their observations.

Also checks will be made of the astronomical constants, such as the positions, motions and distances of the moon and sun.

Scientists will have to wait until Feb. 25, 1952, for the next total solar eclipse, then over two years for the next one, on June 30, 1954. That one starts in Nebraska just as the sun is rising and passes over Iowa, Minnesota, Wisconsin, Michigan, Ontario, Quebec, and Labrador on this continent.

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ASTRONOMY

Sun Blasts of Hydrogen Cause Aurora Display

See Front Cover

➤ THE earth has been bombarded with hydrogen—from outside the earth. No hydrogen bomb scare this, although the atomic projectiles reported by the University of Chicago do come from the sun which is past master of changing matter into energy with which to continue to shine. A great auroral display recently caused the skies to blaze with northern lights.

The spectacular northern lights of Aug. 19, photographed by astronomers at the University of Chicago's Yerkes Observatory, are shown on this week's cover of SCIENCE NEWS LETTER. The picture was taken with a wide-angled camera which covers a field of 140 degrees. The dome of the observatory and other buildings can be seen as silhouettes at the lower part of the picture. The three shadows emerging from the center are supports for the camera's plateholder.

This display allowed Yerkes Observatory astronomer, A. B. Meinel, to determine that the cause was hydrogen gas given off from sunspots. Traveling 1800 miles per second, the hydrogen struck the earth's atmosphere and made it give off light. Scientists have suspected this, but Mr. Meinel proved it by displacement of hydrogen lines in the spectrum of the borealis.

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PSYCHOLOGY

Oxygen Affects Learning

Lack of oxygen affects learning and relearning ability. Individuals vary in the degree to which oxygen lack affects them.

➤ EXPOSURE to oxygen lack equivalent to 30,000 feet altitude causes a loss of learning ability and relearning ability. The loss increases as the exposure time increases from one-half hour to six hours.

This is indicated by experiments with rats reported in State College, Pa., to the American Psychological Association by Dr. William P. Hurder of Louisiana State University.

After being deprived of oxygen, the rats were trained or retrained to find their way through an alley maze. One hundred days later the rats were killed and their brains examined.

Brain changes were found, consisting of a decrease in cellular density with increasing exposure to oxygen lack.

Not all individuals are affected alike by oxygen lack. There is increasing variability in learning loss with increasing exposure to anoxia. But with the brain changes, there is no similar variability, it was found.

Smothering during the process of birth varies in effect with different individuals, Dr. R. Frederick Becker, of Jefferson Medi-

cal College, said, reporting to the same meeting on experiments on guinea pigs delivered by Caesarian operation.

The animals were asphyxiated at birth and later resuscitated with oxygen. Later they were killed and their brains examined.

PSYCHIATRY

More Mental Hospitals

➤ More hospital facilities and personnel are needed to care for emotionally disturbed children, Edgar C. Hayhow, director of the East Orange, N.J., General Hospital and member of the board of regents of the American College of Hospital Administrators, declared at a planning meeting in Washington of the Midcentury White House Conference on Children and Youth.

Extremely few institutions in the country are suitable for inpatient observation and treatment of emotionally disturbed children, he stated.

The parents of all but a very few chil-

The site, as well as the degree of injury, varied. With some it was the thalamus, in others the brain stem, for some the frontal cortex, and others, the lumbo-sacral cord.

Some animals smothered for a short time suffered more than others asphyxiated longer.

Severe cyanosis of the "blue-baby" type did not always result in severe nerve damage.

Smothered animals as compared with litter-mates not asphyxiated were apathetic, less active, less frustrated under stress, were poor learners with limited memories and made repeated mistakes.

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dren, whose emotional problems are serious enough to warrant short term but continuous observation or treatment, must forego such treatment for their children or send them to entirely unsuitable mental hospitals for adults. And very few such hospitals will accept children.

Parents of children whose mental illnesses may require long-term treatment are confronted with a similar situation.

Even children's hospitals and general hospitals need increased facilities and personnel for caring for the child patients.

These two situations plus expansion of hospital facilities and institutions for mentally deficient and crippled children are four problems which Mr. Hayhow declared urgently need consideration by the Conference.

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ENGINEERING

Upside-down Skylight Lights Art Gallery

➤ WHEN the city art gallery at Birmingham, England, was rebuilt after the war, engineers installed a unique means of bringing daylight indoors.

Called a "laylight," the upside-down skylight casts the strongest light in the gallery directly upon the surface of the paintings. From all other points, both above and below the pictures, the light is diffused. The paintings thus seem to stand out from the walls, and the public sees them in light which gives greatest possible emphasis to natural color and contrast.

As shown in the picture, frosted glass at the bottom of the lay-light has been removed. Behind it, when the work is complete, will be a combination of fluorescent and tungsten filament lights for night illumination closely approximating daylight.

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UNIQUE LAYLIGHT—A view in the Birmingham, England, art gallery looking up to the roof light. The strongest light falls on the paintings which seem to stand out from the wall.

BACTERIOLOGY

Cotton Plants of the Future from Bacteria

► BACTERIA—germs to the layman—may be the cotton plants of the future, Prof. M. Stacey of Birmingham University declared at the British Association for the Advancement of Science.

He reported production of high grade cellulose from cane sugar by bacterial action. If carried out on the scale of penicillin production from mold, a huge cellulose crop could be harvested every few days. But economical production would depend on a very cheap sugar source.

In Prof. Stacey's bacterial polysaccharide laboratory, bacteria also are used to produce other useful starch and sugar products such as dextrans which can be turned into rubber-like, gasoline-insoluble plastics or dissolved to form a synthetic blood plasma substitute. Current output of this is 7,000 pints per month.

Tuberculosis germs have yielded six chemically different complex sugars which may be clues to a tuberculosis vaccine.

Radioactively labelled starch for use in vital biological studies has also been produced by bacteria from simple chemicals, called acetates, tagged with radioactive components.

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ENTOMOLOGY

Some Ants See, Some Scent Their Way Home

► SOME ants, foraging for food, find their way back home by sight while other kinds of these insects, in Britain at least, guide themselves homeward by their sense of smell.

Prof. J. D. Carthy of Cambridge University told the British Association for the Advancement of Science that his experiments show that the worker ants of two common British species use predominantly different methods of orienting themselves. The scent trail is laid down by one kind by means of a bodily secretion.

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MEDICINE

Device Cuts Heart Valves With Less Bleeding

► A NEW valve cutter for operating on sick hearts in small children is reported in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Sept. 2).

A 23-day-old baby boy was among the patients on whom the instrument was used with good results, Drs. Willis J. Potts, Stanley Gibson and William L. Riker of this city and Dr. C. R. Leininger of San Rafael, Calif., report.

The instrument is used to cut the constricted valve in the opening between the pulmonary artery and the right ventricle of the heart. Babies born with this condition may be "blue babies." The new instrument, made by Bruno Richter of Glen Ellyn, Ill., was devised to decrease the size of the wound in the heart made by previous instruments which had diamond-shaped cutting blades. Less bleeding and disturbance of heart rhythm are other advantages of the new instrument.

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PSYCHIATRY

Arctic Duty Spoils Morale of GI's

► DUTY in the Arctic affects the disposition of the GI—for the worse. He becomes less cheerful, sleeps less and has less patience, an opinion poll revealed to Maj. Anthony Debons, of the Arctic Aeromedical Laboratory, Ladd Air Force Base, Alaska.

Duty in these northern latitudes also makes a soldier more disgusted and depressed.

These symptoms are, on the whole, typical of neurasthenia, Maj. Debons reports.

Those who reported themselves as more able to endure the cold of a coming winter were less depressed than those who felt less capable of enduring the cold again.

The men polled average 20 years of age and most are unmarried. Those reporting no change in outlook had the highest level of education.

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GENERAL SCIENCE

Fight for Science Foundation Renewed

► AMERICAN scientists have been called to action to rescue the National Science Foundation appropriation of \$475,000 which has been refused by the House Appropriations Committee.

The Inter-Society Committee for a National Science Foundation has been reactivated under the leadership of Dr. Howard A. Meyerhoff, administrative secretary of the American Association for the Advancement of Science, and leading scientists throughout the country are telling the Senate Appropriations Committee about the important job that the newly authorized Foundation could do in the present emergency.

After delay of five years, Congress finally authorized the creation of the Foundation last spring, but money to organize this new civilian agency has not yet been appropriated, although President Truman has repeatedly asked Congress to do so.

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IN SCIENCE

PSYCHOLOGY

Shostakovich Music Is He-Man Stuff

► THE music of Shostakovich and Wagner is considered masculine, that of Mendelssohn and Chopin feminine, by 206 college students asked to rate recordings for "sex character."

This finding, supporting the contentions of psychoanalysts, was reported to the American Psychological Association meeting by Drs. Paul R. Farnsworth, J. O. Trembley, and C. E. Dutton, of Stanford University.

The students, and particularly the men, were more familiar with and preferred the composers of masculine music.

Women with the most masculine interests also tended to prefer the masculine music.

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MEDICINE

Aureomycin Conquers Klebsiella Pneumonia

► DRAMATIC recovery of a man believed to be the first patient to get aureomycin treatment for Klebsiella pneumonia is reported by Drs. Maurice Nataro, David Shapiro and Armond T. Gordon, of the Veterans Administration Hospital at Louisville, Ky., and the University of Louisville School of Medicine, in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Sept. 2) in Chicago.

The patient had been sick 13 days and was almost in coma. Penicillin had failed to help him. Aureomycin, another of the famous mold drugs, was started. Within 24 hours he was much improved and by 48 hours his fever was gone and his temperature remained normal thereafter.

Klebsiella pneumonia is caused by a germ called Klebsiella, or sometimes, Friedlander's bacillus. Even after the discovery of sulfa drugs and penicillin, effective in pneumococcal pneumonias, reports showed deaths from Klebsiella pneumonia as high as 51% to 97%.

Streptomycin began to change the picture, and now the death rate is down to about 20%. That is, only one in five patients dies of the disease when treated with streptomycin. Laboratory tests had shown that aureomycin was effective in halting the Klebsiella germ, and since it is less toxic than streptomycin, the Louisville doctors decided to try it on one patient.

They call the results "dramatic" and advise further trial of it.

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MINING

U. S. Less Dependent on Foreign Cobalt Supplies

➤ MUCH of the strategic cobalt needed in producing special steel alloys, and in permanent magnet alloys, may be mined in the United States in the near future, it was indicated in Salt Lake City at the meeting of the American Mining Congress.

A larger quantity of domestic cobalt would relieve the present dependency of America on foreign ore. Consumption by American refiners of cobalt contained in alloys and ores is approaching 3,000,000 pounds annually. Belgian Congo is now the chief source of supply. Canada and other countries produce some for American markets.

"Years of almost complete dependence upon foreign sources of cobalt will come to an end when production of this vital element begins at the Blackbird Mine of the Calera Mining Company near Forney, Idaho," Edwin B. Douglas, manager, told the meeting.

Proved reserves at present are sufficient to permit operation of a 600-ton mill for a considerable number of years, he stated. No serious complications are anticipated in mining the ore bodies proved so far.

Difficulties of unusual scope were encountered in treating ore to produce a cobalt and copper concentrate. These, however, have been solved. A satisfactory separation method has been developed. The separation is made by differential flotation methods employing long conditioning at relatively high temperature of pulp.

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MEDICINE

Warn Against "Shotgun" Use of Miracle Drugs

➤ THE strong possibility that the "shotgun" administration of two or more antibiotics may boomerang, with cancellation of benefits of the drugs, has been raised in research at the University of California School of Medicine.

The custom of giving two or more "miracle drugs" has been growing in medical circles in recent years. "Shotgun" treatment is used especially when the infectious agent cannot be definitely identified.

The physician knows that one antibiotic is especially effective against one organism, while another is more effective against another. The theory is that by giving several drugs, one will be certain to destroy the infecting culprit.

A further reason for "shotgun" treat-

ment has been the finding of complementary action between some antibiotics when they are given simultaneously. For example, the California researchers had already found that streptomycin and penicillin are more effective together than when given separately.

However, the opposite effect has been found when penicillin and chloramphenicol are given together. In mice infected with a deadly streptococcus, either of the two drugs saved 80% of the animals. When the two drugs were given simultaneously, only 40% of the mice were saved from death. The same results were obtained over and over again.

The California scientists say that this same mechanism may occur in man, and that physicians therefore should be cautious about giving antibiotics in the "shotgun" fashion.

The research was done by Drs. Ernest Jawetz and R. S. Speck and Miss J. B. Gunnison, of the department of bacteriology.

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CHEMISTRY

Anti-Gas Chemical Cures Lead Poisoning

➤ A SUCCESSFUL treatment of lead poisoning through use of BAL, developed by the British for use against lewisite poison gas, is reported from Denmark in LANCET (July 29).

BAL has already been found of great importance in countering intoxications produced by arsenic, gold and mercury. Dr. Poul Bastrup-Madsen of Arhus Municipal Hospital, Copenhagen, has now used this drug, dimercaprol, as British anti-lewisite is called, in bringing about successful recovery of two women who had swallowed litharge, a lead oxide.

The symptoms of the poisoning were not aggravated by the treatment, which resulted in the more rapid removal of the lead from the body than other treatments, such as ammonium chloride and parathyroid hormone.

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PLANT PATHOLOGY

Oak Wilt Hits Ozark Trees

➤ THERE is tree trouble in the Ozarks. Aerial surveys show that oak wilt, a serious forest disease that cannot be controlled, is spreading in Missouri and Arkansas. Giant oaks are the first attacked by the fungus. U.S. Department of Agriculture forest pathologist Dr. T. W. Bretz is urging vigorous research to work out control of this forest menace. Cleveland is the latest new location of the disease.

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MEDICINE

Safer Hot Wet Packs For Polio Victims

➤ BETTER and safer hot wet packs for polio victims are possible through new equipment reported at the American Congress of Physical Medicine in Boston.

The new equipment consists of a portable electric apparatus that generates heat within a moistened pack. The current is an interrupted one in alternating, automatic cycles. This produces a significant rise in temperature within the polio victim's muscles.

The electrically heated packs, just developed by the General Electric Company, were tested by Drs. Alex Harell and Sedgwick Mead and Miss Emily Mueller, physical therapist, of Washington University School of Medicine. The apparatus is not yet available for general use.

From the preliminary trials, Dr. Harell reported the following advantages over the conventional hot packs: safety to patient because of internal regulation of the heating mechanism; minimum of discomfort to the patient because the pack does not need to be reapplied after reheating and can be laced or tightly wound in place, permitting free movement of arms and legs while the pack is on; portability of the device, simplicity of use and minimum number of persons needed to apply the pack.

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PSYCHOLOGY

"Blue Monday" Affects Labor, Absenteeism

➤ THERE is something to that idea of "Blue Monday" so far as labor output and absenteeism are concerned.

On Mondays the average hourly output of British industry is lowest, and more employees are away from their jobs, Dr. W. Baldamus, sociologist of Birmingham University, reported to the British Association for the Advancement of Science meeting.

In general both turnover and absenteeism decrease with length of service, Dr. Baldamus found. Many of the reasons for poor or good performance by workers are linked to the industrial situation and attitudes toward work and leisure, instead of such general concepts as practice, interest, willingness and boredom.

Accidents in British mines fluctuate with the way the nation is feeling and reacting, Dr. T. T. Paterson, anthropologist of Cambridge University, reported. Accidents, absenteeism, production, strike intensity and other human conditions in the mines vary with highway accidents and strikes throughout all industry.

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CONSERVATION

Fire and Famine Foment Unrest

Lack of food sets off riots in South Africa. Improved production per acre, decentralized industries and village improvement would help to remedy the problem.

By MARJORIE VAN DE WATER

➤ **DARKEST** Africa is lighted by the flames of burning land and is parched with thirst. There is not enough to eat.

This is what has touched off the race and class riots that are tearing sections of the continent apart. Hunger is fomenting unrest among teeming millions of the African people.

The native population of Africa is doubling in some colonial areas, but agriculture is not keeping up with enough food for the additional hungry mouths. Result: Food shortages and increased food prices with attendant unrest, agitation, and class conflict.

Some of the reasons for the agricultural shortages are described by Dr. Walter C. Lowdermilk, land use expert, who has just returned from a survey of the British colonies in Africa.

Flying from London he visited colonial areas in West Africa; thence to Johannesburg, and visits to Bambolan, Swaziland, Southern Rhodesia, Nyasaland, Northern Rhodesia. On his way back, Dr. Lowdermilk stopped to visit South Africa's new ground nut scheme.

80% Land Burning Annually

A tragic problem for agriculture is the deliberate burning over of 80% of the land every year, setting the whole continent aflame. Various reasons are given for this burning, such as to capture wild animals or for protection against them, but the truth of the matter seems to be that the people are in the grip of a compulsion to burn, born of superstition and ignorance.

The land must be burned, they feel. It always has been burned over. It must continue to be. The British government has failed to wipe out this compulsion. Colonial administrators now are trying to get the people to do their burning early in the dry season when it will do the least damage.

Even more serious than the food shortage is the water famine. This is due partly to climatic conditions and partly to the geology. Rain falls only during four or five months of the year. More than half the year is dry season.

Normal geologic erosion over countless centuries has worn the land and rock down until the land of West Africa is a vast plain. The soil generally is derived from solid, crystalline rock which holds little ground water. Springs are rare; much of the earth dry and barren except where

irrigated

Occasionally the flat landscape is relieved by the stumps or cores of mountains left by the process of erosion. These are known as "inselbergs."

Central West Africa is more fortunate, but there the native people are ignorantly destroying their natural wealth despite the advice of agricultural officers.

Valuable Forests Burned

A rain forest belt with mahogany and other valuable trees extends along the coast south of the Bulge. But to the people who find themselves living there and in need of food for empty stomachs, the trees seem only an obstacle to gardening. So the forest giants are cut down and burned.

The ashes which contain the minerals the trees have taken from the soil enrich the garden land and result in good crops, but only for a single year or two—rarely three years. Then the farmer moves on to another locality, and cuts more trees to repeat the process, called shifting cultivation.

In this way 100,000 acres of beautiful rain forests are being destroyed each year on the Gold Coast.

The rain forest belt of West Africa is bordered by 500 miles of savanna land covered only with low trees and spiny shrubs. Beyond the savanna is a thorn-bush savanna and after that the Sahara itself.

Power Possibilities Great

Rivers in this rainy part of Africa offer great agricultural and power possibilities if modern methods of water use and conservation were applied. The Niger River, until about 40 years ago, was a river of mystery.

No one knew that the river which rises near the west coast of Africa at Sierra Leone and flows northeast far into the interior past Timbuktu is the same river which flows southeast through Nigeria and empties into the Atlantic.

With modern agricultural methods rice could be grown in abundance. Especially in Sierra Leone, Dr. Lowdermilk believes, enough rice could be grown to fill local needs and to supply England with all she could possibly consume.

In and near Kano in northern Nigeria, peanuts are grown in greater quantities than present facilities make it possible to ship out by a narrow gage railroad. The people had to build some 200 great pyra-

mids of peanuts 20 to 30 feet high and containing as much as 250,000 tons.

Another exceptional locality from the point of view of climate is the Jos plateau in east central Nigeria. On this flat tableland, 5,000 feet high and rich in tin, Dr. Lowdermilk found an ideal summer resort climate. There, too, he discovered that a prehistoric people—about whom there remains not even a legend—had built an elaborate system of terraces for farming on slopes.

These terraces were laid out so well that Dr. Lowdermilk thinks that the builders must have had accurate instruments. They built stone drainage channels and there is even evidence that they had provided for irrigation.

Damage from Erosion

Other parts of Nigeria have been terribly damaged by erosion. In some places, great gullies have been torn in the earth's surface 200 to 250 feet deep. Although tremendous sums have been spent in an attempt to stop the deepening of these gullies, the effort has been unsuccessful.

Dr. Lowdermilk observed hopeful possibilities for tree farming in South Africa. In one area in Swaziland in the southern tip of Africa, trees grow with phenomenal rapidity. This is in a misty zone with heavy rains, and trees grow as much as ten feet a year. The wood production is about five times as fast as that grown in the



"GROUND NUT" SCHEME—Dr. T. P. Phillips inspects his crop of peanuts which is part of the much publicized plan to grow peanuts for oil for England. Director of agriculture of the "ground nut" scheme, Dr. Phillips is a noted South African agriculturist.



CROP FOR CASH—In one misty rain-forest area, the trees grow so very rapidly that they form a profitable crop for tree farmers who grow them to cut and sell.

United States Many people there are engaged in tree farming because the return is so fast that it makes it very profitable.

In another misty belt in Southern Rhodesia, Dr Lowdermilk saw in a remnant grove of about 200 acres, at Mt Salinda, a giant mahogany tree nine feet in diameter and 170 feet tall. But these forests are constantly endangered by the practice of burning over the land. On fire-swept savanna, he saw what he calls "cripple trees," damaged and deformed by burning so that the wood is worth nothing except for fuel.

Pilot Projects as Models

To solve Africa's tremendous twin problems of over-population and agricultural underproduction, Dr Lowdermilk urges the establishment of pilot projects designed to show African natives in a concrete, visible way what can be done to turn their land to greater production.

Such projects offer a pattern for point four assistance; they could serve to demonstrate measures of rural reconstruction, Dr Lowdermilk points out.

These pilot projects of rural reconstruction should have three legs to stand on. The first leg, agriculture, would demonstrate improved production per acre, but more important, increased production per man, which will give farmers greater purchasing power.

They will show the people what a modern farm is like. They can go home, imitate, and turn their stone-age farms into modern food producers.

But more efficient agriculture would release man power. If there are not jobs to take up the manpower, the agricultural program would bog down. So the second leg would be decentralized rural industries to make articles that would improve

living for the people—tools, vehicles, home furnishings.

The third leg would be village improvement: roads, transportation, sanitation, communication, water supply, clinics, schools.

These three aspects of the pilot project should move along together. They would also serve as training grounds for the people and for teachers of the people. The education in model schools should then be tied in to the community life, to the land and to reconstruction. The church should also be located there, forming a part of

GEOLOGY

Wegener Theory Disputed

➤ EUROPE and America never lay cheek by cheek in a past geological era only to drift apart and form what is now the Atlantic Ocean.

The famous Wegener theory of continental drift advanced over two decades ago was disputed in Birmingham before the British Association for the Advancement of Science by a Dutch geologist, Prof. J. H. F. Umbgrove of Delft.

Even if there was a mysterious mechanism that allowed continents to drift over the face of the earth, data presented by Prof. Umbgrove contradict the supposed consequences of the drift.

Prof. R. D'O. Good, botanist of University College in Hull, agreed that the idea of vast continental movements does not fit the facts. The distribution of flowering plants in the world is usually explained by assuming that the isolation of the chief land masses was once less than it is today, but Prof. Good finds that this is not necessarily so.

The discontinuous distribution of animals in the world favors the Wegener

theory, however, Dr H. E. Hinton, zoologist of Bristol University, said.

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WILDLIFE

African Rats Reach National Zoo

➤ LOOKING somewhat like undernourished porcupines, two strange, shy African rats have come to the National Zoological Park in Washington. Their technical name is *Lophomys*—meaning giant crested spiny-haired rat, their home, the British protectorate of Uganda in East Africa. Strictly vegetarians, and believed by Dr William Mann, director of the national zoo, to be in a rodent family all to themselves, the animal newcomers may be the first of their breed ever to have reached the United States.

Science News Letter, September 9, 1950



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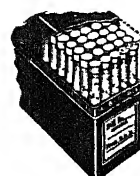
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the bill provisions for registering and drafting personnel in scientific, professional, technical and other occupational categories. It is believed this was done with the knowledge of the Defense Department. If it had passed in this form, the Defense Department, through Selective Service, would have had top priority on the best brains and skills of the country, throwing the leavings to vital private industry and university laboratories.

At this point the National Security Resources Board stepped in with an amendment which would have taken control away from Selective Service and put it in the hands of President Truman. Under the plan he was expected to set up a civilian board of experts to allocate this precious talent where it could best be used, whether in or out of uniform. This would have been done through a provision for deferment "in the national interest."

NSRB was not yet ready to take this step, but the move forced the top civilian planning board to show its hand with some of its manpower plans.

When the Defense Department saw that NSRB would probably win out in placing control of scientists and other highly skilled citizens in the President's hands, it suddenly showed no more interest in anybody but doctors and dentists. Thus the bill, when it is signed by the President, will provide for the drafting of members of the healing arts professions and those in allied categories only.

Now the scientists are beginning to organize. They will present plans to President Truman and to the NSRB, which envisage the efficient usage of this highly valuable manpower.

Science News Letter, September 9, 1950

NUTRITION

Egg Has Best Amino Acid Distribution

➤ A WHOLE egg rates at the top of the protein nourishment scale in having the best distribution of 17 amino acids, or protein building blocks.

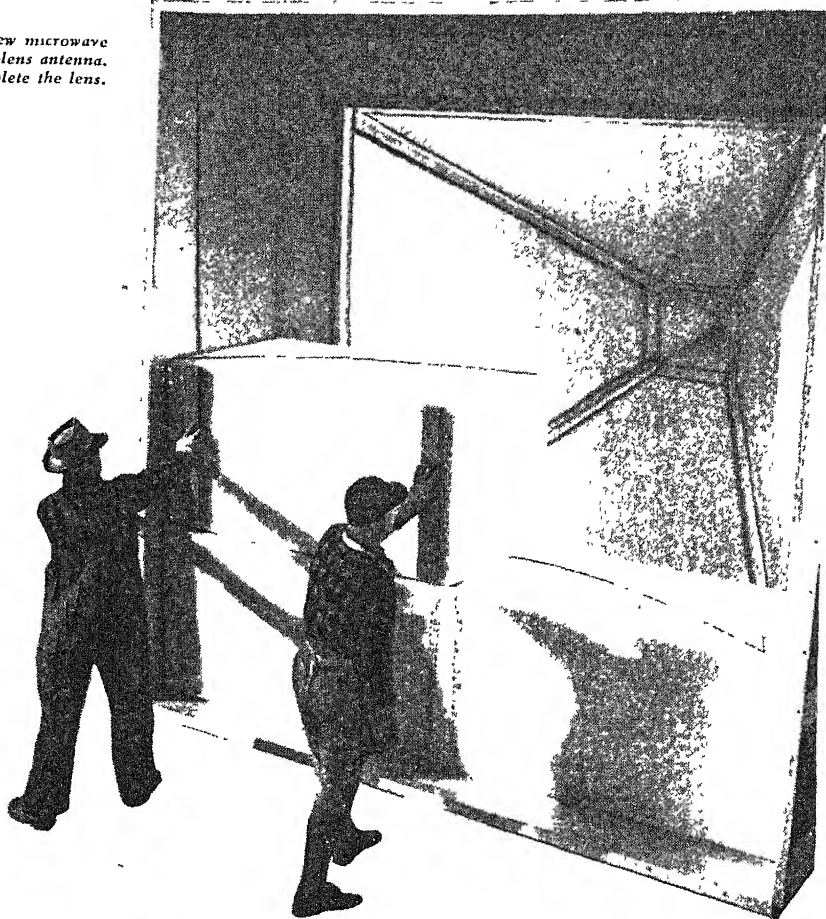
This finding, made with a new "measuring stick" for determining the nourishing values of protein, was announced by the Rutgers University Bureau of Biological Research in New Brunswick.

In descending order of value, the other protein sources studied were: egg white (albumen), beef or milk, peanut flour and wheat gluten.

Ten colleges and universities and 13 industrial laboratories made this study.

Science News Letter, September 9, 1950

Mounting Bell's new microwave lens in a horn-lens antenna. Other blocks will complete the lens.



A focus on better, low-cost telephone service

In the new microwave radio relay system between New York and Chicago, giant lenses shape and aim the wave energy as a searchlight aims a light beam.

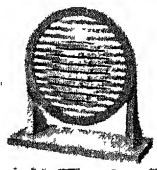
Reasoning from the action of molecules in a glass lens which focuses light waves, Bell Laboratories scientists focus a broad band of microwaves by means of an array of metal strips. To support the strips these scientists embedded them in foam plastic which is rigid, light in weight, and virtually transparent to microwaves.

This unique lens receives waves from a wave guide at the back of the horn. As they pass across the strips, the waves are bent inward, or focused, to form a beam like a spotlight. A similar antenna

at the next relay station receives the waves and directs them into a wave guide for transmission to amplifiers.

This new lens will help to carry still more television and telephone service over longer distances by microwaves. It's another example of the Bell Telephone Laboratories research which makes your telephone service grow bigger in value while the cost stays low.

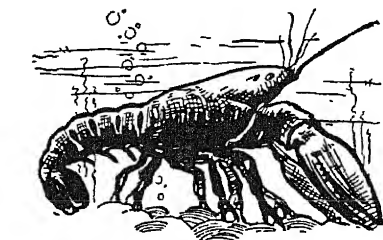
Laboratory model of the new lens. A similar arrangement of metal strips is concealed in the foam plastic blocks in the large picture.



BELL TELEPHONE LABORATORIES

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ZOOLOGY

NATURE
RAMBLINGS

Lobster

➤ AN earlier generation once took great delight in a story about a Midwestern farmer who refused a lobster on the grounds that he "didn't eat bugs." Modern refrigerated railroad cars and anywhere-any time air cargo service has made it possible for the innermost of inlanders to have lobster regularly now. Most of us "eat bugs"

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even if our grandparents could or would not have them in the house

The farmer of the anecdote was not so far wrong at that. The lobster and his relatives the crab, shrimp and inland "claw-dads" really are cousins of the insects. They form the marine division of the great order of Arthropoda, which means "jointed-leg animals," just as the insects form the infantry and airborne divisions. The lobster and his relatives are known collectively as the Crustacea because of the hard shell, or crust, in which they are encased.

Lobsters and insects are alike in having jointed bodies and legs, in having their skeleton on the outside rather than the inside of their bodies, in having compound eyes made up of a mosaic of little eyes, and in many other respects.

The lobster differs from the insect in the obvious matter of having no wings, he would have little use for them in the watery depths he inhabits. Neither does the lobster have a division between head and chest, such as an insect has; his chest begins right under his chin, without formality of a neck.

As if to make up for his lack of wings, the lobster has two pairs of antennae or feelers. The insect has but one pair. And finally, while the insect has only six legs, the lobster glories in ten. He has two of the most powerful sharp-ridged claws in the marine kingdom and no hesitancy in using them if a careless fisherman picks him up by the wrong handle. By reason of his legs and claws, the lobster and his nearer relatives are known to zoologists as "decapod crustaceans."

Only very recently has science begun to suspect that the lobster has a hidden talent which puts him in the company of such skilled navigators as the homing pigeon and the honey bee.

Experiments with lobsters off Bermuda showed they can return unerringly to their favorite feeding grounds even when taken far out into deep water or to the other side of large land masses. Drs. Edwin P. Creaser and Dorothy Travis of the Bermuda Biological Station believe lobsters are fully "aware" of where they are and have a remarkable homing instinct. The how and why of the trait remains an unanswered and puzzling biological mystery.

Science News Letter, September 9, 1950



NEW THEORIES

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MINING

Roof Bolting Prevents
Roof Falls in Mines

➤ THE use of roof bolts to prevent roof falls in mines, the cause of many fatalities, was called in Salt Lake City one of the most progressive steps ever taken in promoting underground safety

The statement was made by M. C. McCall of the US Bureau of Mines at the meeting of the American Mining Congress. Roof bolting is sponsored by the Bureau, he said, because safety and maximum efficiency go hand in hand. The use of roof bolts is approved by miners and management alike.

Roof bolts, which replace in part the pillars of earth or timbers to support the roof after ore is removed, are steel rods driven into the roof either vertically or at an angle to hold the layers together. Rods of wood, in drilled holes, have been successfully used where corrosive water gives short life to steel pins.

Roof bolting is not a new idea but its use has greatly increased recently. Labor requirements are much reduced by this system of ground support, Mr. McCall stated. Tonnages of ore have increased steadily, and production crews need not wait for timber crews to stand timber.

He reported the results of roof bolting in both lead and iron mines. All iron ore mines in Alabama in which roof bolts have been installed attained the best injury records in their history in 1949, he stated.

Roof bolting is coming into rapid use in coal mines, another meeting of the American Mining Congress was told earlier this year by Edward Thomas, also of the Bureau of Mines. In 1949, he said, approximately 200 coal mining companies were using bolts to support 14,000,000 square feet of roof surfaces.

Science News Letter, September 9, 1950

GENERAL SCIENCE

Triple Science Manpower
Needed for Survival

➤ TRIPLE America's present scientific manpower is needed for national survival. Prof. John S. Nicholas of Yale warns that we are in competition with keen scientific minds in Russia that "already have access to much of the same knowledge stockpile that we have." He wants a national program, like the GI college program, that will select early the outstanding minds with scientific aptitudes, give them a rapid and rounded education and subsidize those who prove to be creative scientists. These scientists would produce the information that can be engineered into technical progress needed for a long and continuous struggle with communism.

Science News Letter, September 9, 1950

Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C. Ask for free publication direct from issuing organizations.

ANNUAL REPORT OF THE BOARD OF REGENTS OF THE SMITHSONIAN INSTITUTION 1949—Smithsonian Institution—*Gov't Printing Office*, 422 p., illus., \$2.75 The appendix contains the usual summary articles for which this report has long been famous. Such articles as "Th Elementary Particles of Physics" by Carl D. Anderson, "Modern Soil Science" by Charles E. Kellogg and "The State of Science" by Karl T. Compton are included.

ANNUAL REPORT OF THE FEDERAL SECURITY AGENCY 1949—*Gov't Printing Office*, 214 p., illus., paper, 45 cents Contains the Administrator's report and the reports of all the Agency's constituent organizations.

THE CONDENSED CHEMICAL DICTIONARY—Francis M. Turner, Editorial Director—*Reinhold*, 4th ed., 726 p., \$10.00 A standard dictionary revised and enlarged by Prof. and Mrs. Arthur Rose

CONFERENCE ON REVISION OF UNITED STATES MINING LAWS—*Gov't. Printing Office*, 295 p., illus., paper, \$2.00 Hearings before a Special Subcommittee on Public Lands, House of Representatives, eighty-first congress first session

CORALS OF THE DEVONIAN TRAVERSE GROUP OF MICHIGAN, PART III, ANTHOLITES, PLEU-RODICTYUM, AND PROCTERIA—Erwin C. Stumm—*University of Michigan Press*, approx., 16 p., illus., paper, 75 cents.

THE EVOLUTION OF SCIENTIFIC THOUGHT. From Newton to Einstein—A. d'Abro—*Dover*, 2nd ed., illus., \$3.95. A non-technical account of classical and modern physics.

THE FRENCH POLAR RESEARCH EXPEDITIONS 1948-1951—Paul E. Victor, Director—*The French Embassy Press and Information Division*, 22 p., illus., paper, free upon request to publisher, 610 Fifth Ave., New York 20, N. Y. A general report.

GEOLOGY OF BRAZOS COUNTY, TEXAS—A. A. L. Mathews—*Texas Engineering Experiment Station*, 14 p., illus., paper, free upon request to publisher, College Station, Texas. The author's interpretations. A map is also included.

HIGHWAY LOADS AND THEIR EFFECTS ON HIGHWAY STRUCTURES BASED ON TRAFFIC DATA OF 1942—Henson K. Stephenson and A. A. Jakkula—*Texas Engineering Experiment Station*, Bull. No. 16, 134 p., illus., paper, free upon request to publisher, College Station, Texas.

INDUSTRIAL CHEMICALS—W. L. Faith, Donald B. Keyes and Ronald L. Clark—*Wiley*, 652 p., illus., \$8.00. Technical and economic data concerning the major industrial chemicals.

MAMMALS OF THE REXROAD FORMATION FROM FOX CANYON, MEADE COUNTY, KANSAS—Claude W. Hibbard—*University of Michigan Press*, approx. 79 p., illus., paper, \$1.50.

MECHANICS AND PROPERTIES OF MATTER—R. C. Brown—*Longmans, Green*, 276 p., illus., \$2.25. An introductory college physics text.

MONSTERS OF OLD LOS ANGELES The Prehistoric Animals of the La Brea Tar Pits—Charles M. Martin—*Viking*, 127 p., illus., \$2.50 A report on the fossil remains of prehistoric animals taken from the tar pits in modern Los Angeles. It is written primarily for the layman and illustrated by Herb Rayburn

NEW EVIDENCE OF THE LOWER MIOCENE AGE OF THE BLACKTAIL DEER CREEK FORMATION IN MONTANA—Claude W. Hibbard and Kendall A. Keenmon—*University of Michigan Press*, approx. 12 p., illus., paper, 50 cents

RUBY THROAT The Story of a Humming Bird—Robert M. McClung—*Monrow*, approx. 50 p., illus., \$2.00 A picture-story of one year in a humming bird's life Well illustrated

SCIENCE LABORATORIES IN NEED—Robert Legris—*Unesco* (U. S. Distributor: Columbia University Press), 23 p., illus., paper, 15 cents. A report on the conditions in the college laboratories of Europe and Asia

SEPTIC TANK STUDIES. Individual Sewage Disposal Systems—*Housing and Home Finance Agency*, Tech. Paper No. 14, 84 p., illus., paper, free upon request to publisher, Washington 25, D. C.

SEXUAL BEHAVIOR IN SOCIETY—Alex Comfort—*Viking*, 157 p., \$2.75. Among the topics discussed are monogamy and sexual conduct, social and biological backgrounds of sexual behavior and sexual sociology. Primarily a handbook for social workers.

SOME CULTURAL EXPERIMENTS WITH KENAF IN CUBA—Joe E. Walker and Manuel Sierra—*Gov't. Printing Office*, U. S. Dept. of Ag. Circ. No. 854, 24 p., illus., paper, 10 cents. A report of experiments on this plant

TREE CROPS: A Permanent Agriculture—J. Russell Smith—*Devin-Adair*, 408 p., illus., \$6.00. A discussion of nut, persimmon and cork trees in relation to finding the right one for your soil and your climate

TV INSTALLATION TECHNIQUES—Samuel L. Marshall—*Rider*, 330 p., illus., \$3.60. Discusses the many problems in installing a television set For the TV installation technician

YOUR BICYCLE—Steve Kravnick—*Bennett*, 126 p., illus., paper, \$1.35 A practical guide on how to repair and care for a bicycle.

YOUR CHILD AND OTHER PEOPLE: At Home, At School, At Play—Rhoda W. Bacmeister—*Little, Brown*, 299 p., illus., \$3.00. Presents suggestions on how to aid your child in his social life. Written to aid children through the age of eight.

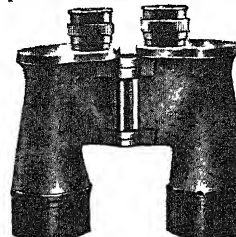
YOUR HAIR: Its Health, Beauty and Growth—Herman Goodman—*Emerson*, 287 p., illus., \$2.95. Discusses the many problems of hair retention, regrowth and removal.

YOUR SCHOOLS: An Approach to Long-Range Planning of School Buildings—William W. Caudill—*Texas Engineering Experiment Station*, 43 p., illus., paper, \$1.00 outside of Texas.

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⚙️ **WATER SYSTEM** for the home will pump 250 gallons per hour from a 22-foot depth but is small enough to put under a kitchen sink. Within the unit is a 10-gallon pressure tank, a jet pump and a motor unit, all housed in a casing 27 inches high and 16 inches in diameter.

Science News Letter, September 9, 1950

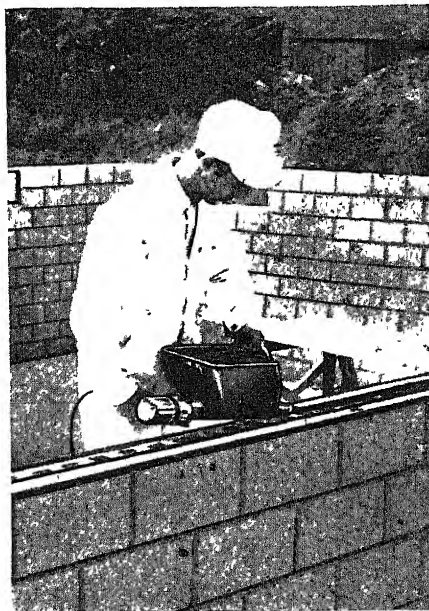
⚙️ **FOUNTAIN TOOTHBRUSH**, a recently patented gadget, has rubber hose connection from a faucet to the end of its tubular handle through which water is delivered to the bristles. Its feature is an attachment device at the end of the handle, so that different brushes may be used.

Science News Letter, September 9, 1950

⚙️ **FILM VIEWER** for transparent slides in two-by-two-inch cardboard mounts holds 20 slides and permits them to be viewed rapidly one after another by a finger movement. After viewing, slides are returned to their original position in their original sequence and can be re-viewed.

Science News Letter, September 9, 1950

⚙️ **MORTAR GUN**, shown in the picture, is for use in applying mortar on bricks or



blocks without the skill required in trowel application and with less waste. It is an electrically-operated device with an end-

less screw inside of the type used in familiar meat grinders.

Science News Letter, September 9, 1950

⚙️ **SEAMLESS ALUMINUM** sheathing for telephone and electric power cables, already in experimental use, is thinner, stronger and lighter in weight than the usual lead tubing. The new sheathing, produced by a cold reduction process, is softer and more flexible than earlier aluminum sheathing.

Science News Letter, September 9, 1950

⚙️ **ZIP-SLEEVE RAINCOAT**, designed in the U S Department of Agriculture, has cape-like sleeves which can be worn open on the front or closed by means of a zipper. It can be made of either water-resistant cotton fabric or water-proof plastic film.

Science News Letter, September 9, 1950

⚙️ **PLASTIC HAND**, which can be stuck on a wall in the home by means of a suction cup, is a handy holder of neckties, hosiery, towels and lingerie when any of these articles are tucked on its outstretched fingers. When not in use, it folds up and back against the wall.

Science News Letter, September 9, 1950

Do You Know?

The secret of restful sleep is the ability to relax.

India has about 170,000,000 cattle, or one-third of the world's cattle production.

Brain workers require more sleep than persons whose work consists of physical labor.

Jaws of small animals, with the teeth left in, were used to comb the hair of early women, it is said.

Ragweed pollen is believed to be responsible for 70% of the hay fever cases in the eastern United States.

Cows with good bedding in the dairy stable spend more time lying down than they would otherwise; this saves energy and increases milk production.

Rubber fenders, extending half way around each wheel, are being tested on streetcars; they keep mud and dirt from electrical parts, do not corrode, and never rattle.

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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE



Enemies of Peace

See Page 183

A SCIENCE SERVICE PUBLICATION

BIOLOGY

From Now On: Cells

Rapidly dividing cells, which hold the secret spark of life, are still the top mystery of science. This secret may be broken in the research of tomorrow.

By WATSON DAVIS

This is the last in a series of glances for a while into science.

➤ THE primary mystery of the world is still that of life and death. No longer do any bold scientists have confidence that what we now know about purely mechanistic physics and chemistry, applied biology, will explain the spark of life and the fundamental difference between the living and the non-living.

Death, particularly, is the motive power behind all religions and many philosophies. The eternal questions seem to be what is life, what was the origin of consciousness, organized growth, and the ability to reproduce one's kind. What is the future of life as we know it?

We are not sure how life originated on the earth. Did it arise out of slimes of seas a couple of billion years ago, warmed by the sun of early eons? Has it arisen more than once in the history of the earth? Is there a chance that in primitive form life comes into being in our own time?

The viruses consisting of complex and relatively gigantic protein molecules have some of the attributes of living matter. They reproduce themselves and yet they are not, presumably, alive.

Biologists have explored into living cells and tried to put the searching fingers of their intellects upon the vital substances. Within the germ cell there is a nucleus. Within this spherical body there are chromosomes, units that carry on the heredity of life. Within the chromosomes there are genes which determine the shape and whole structure of the living thing starting its marvelous new life.

And all of these persistent and highly specific parts of the cell are made up of atoms and molecules, the same kind of atoms and molecules that compose the non-living rocks and walls and other things of everyday life.

There is one significant difference between the composition of the living and the non-living, that is, in the way in which the atoms and the molecules they form are arranged. Dr. Erwin Schroedinger, Nobelist, among the many who have pondered this mystery of life, believes the secret lies in the atomic arrangement and the structure of the fundamental elements.

Somewhat as there seem to be two physical laws, one governing what happens within the nucleus of the atom, and the

other governing everything else in the universe, so the living organism seems to have a different sort of thermodynamics than inorganic matter which allows it to concentrate and build in an orderly manner instead of dissipating chaotically.

A half century ago there was high confidence in some quarters that the physical scientist could, by extending his laws, ex-

GENERAL SCIENCE

USSR Physicist Rebuked

➤ THE Russians have slapped down their top theoretical physicist for being a "spreader of idealistic assertions" who has a "negative attitude toward dialectical materialism and in his writings sometimes acted as a loud-speaker for the opinions of bourgeois physicists." This latest victim of the "Marxist-Leninist theory" is Dr. J. Frenkel, recognized as a top man in theoretical physics and quantum mechanics.

Dr. Frenkel's work could conceivably have been in connection with the development of the Russian A-bomb, although American physicists who know and admire his theoretical work decline to hazard a guess as to that.

According to a speech by a Prof. D. N. Nasledov, of the USSR Academy of Sciences, printed in the Leningrad *Pravda* and reprinted in the American *Physics Today*, Dr. Frenkel "admitted his ideological errors and in his declaration stated that he had come to the conclusion that the Marxist-Leninist theory in the natural sciences and particularly, in the science of physics, is of foremost importance."

This sort of thing is not new to Dr. Frenkel. In the 1920's, during a popular lecture in Russia, he repeated the current joke among physicists about electrons "On Mondays, Wednesdays and Fridays," he said, "physicists believe electrons are waves, on Tuesdays, Thursdays and Saturdays, they think electrons are particles of matter."

Whereupon a handsome young female communist in the audience rose from her chair and berated Comrade Frenkel. "This sort of bourgeois compromise," she stated, "cannot exist alongside dialectic materialism." After that, things being more lenient in Russia in those days, Dr. Frenkel went into voluntary exile for a few years.

There is evidence in this most recent speech, as printed in the Leningrad *Pravda*, that the Russians are trying to cook up an argument in physics similar to the argu-

plain life. Today the problem is not so simple.

For the future:

A. All the basic research upon chemicals, living organisms, disease and everything else within the realm of scientific investigation, including the development of mathematics, will be used for hints that may be useful in solving this mystery of life.

B. In the studies upon the viruses and related protein complexes, there may come an opportunity with more progress and knowledge to aspire again to attempt the creation of living from non-living matter.

C. Even the millions upon millions of galaxies of stars, remote as they are from the minute vigor of an embryo, may give their hints upon understanding the nature and meaning of life.

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ment in biology which produced Lysenko.

"Creative brigades have been formed," said Prof. Nasledov, "which have been busy studying the two basic fields of modern physics (quantum mechanics and the theory of relativity) with regard to which bourgeois critics have uttered so much idealistic nonsense."

Prof. Nasledov expresses the hope that out of these "creative brigades" will come papers directed against these "bourgeois perversions."

American physicists cannot imagine what hook the Russian physicists will find on which to pin an argument with the Western world. Nor do Western scientists think that such goings-on will affect too much the actual quality of the work the Russian physicists are doing, except insofar as their time is wasted in attending meetings of "creative brigades." There is no evidence yet, in papers published by Russian physicists, that dialectic materialism has crept into their work to its detriment.

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MEDICINE

Army Gets X-rays At Wholesale Rate

➤ UNCLE Sam is getting the draft X-ray and blood tests at a fair wholesale rate, although doctors do admit that bulk of gross business that some practitioners and hospitals are getting is very nice for them indeed. In Washington the workmen's compensation schedule followed by doctors in insurance cases allows \$5 to \$35 per X-ray instead of the \$3 fee approved by the army for the X-ray alone. Blood tests for syphilis (Wassermann and Kahn) are rated at \$5 instead of the army rate of \$2.

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MEDICINE

Clue to Virus Origin

By a yet unknown process the polio virus reduplicates itself in the nuclei of the cells of the human body. The virus was heretofore thought to exist only in the cytoplasm.

➤ A NEW chemical attack on polio has given scientists at Yale University in New Haven, Conn., a working theory of the origin of the virus and clues to the problem of immunity and resistance to it.

The polio virus, according to this theory, is manufactured by cells of the human body, with the first virus that invades the body serving as a template. But whether the virus reduplicates itself or is made by the cells of human spinal cords, the manufacturing process goes on in the nucleus of the cells.

Findings supporting this new approach to the polio problem were announced by Drs. Joseph L. Melnick and John B. LeRoy of Yale University School of Medicine at the Congress of the International Society for Cell Biology in New Haven, Conn.

Scientists heretofore have thought the polio virus existed only in the part of the cell called the cytoplasm, which is the fluid that bathes the nucleus. Finding it in the nucleus may explain, for example, why a person who had polio at the age of two

might still have antibodies to the virus in his body at the age of 70 years. Small amounts of the virus may have been locked away in the cell nucleus all the time, giving rise to the antibodies.

How the virus attacks and ultimately causes the breakdown of cells in the spinal cord, the part of the body most severely affected during polio, could also be explained by the new theory. Within the nucleus is a particle called the nucleolus. The virus may make enormous demands on the manufacturing process in this nucleolus which eventually result in the complete breakdown of the cell structure.

Finding the polio virus in the nucleus of the cells also gives "new light" on the relationship of fatigue to polio.

Many parents as well as doctors know that being over-tired at the time polio attacks makes the victim more liable to paralysis. The proteins of the cell nucleus, Swedish scientists have found, are consumed rapidly after a period of fatigue and are re-formed at a much slower rate.

"It would seem," Dr. Melnick said, "that the less fatigue an infected individual is subjected to, the greater would be the chances of maintaining adequate supplies of cellular nucleoprotein and preventing the onset of paralysis."

Nucleoprotein, one of the materials essential to all life in the structure of cells, has an earthworm-like appearance when seen via electron microscope photographs.

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CHEMISTRY

Electrical Attraction Is First Virus Attack Step

➤ A THEORY that electrical attraction governs the first step in the attack of disease-causing viruses on body cells was reported to the American Chemical Society meeting, Chicago, Ill.

Blocking this attraction would be the way to give immunity to the virus, according to this theory.

The blocking is possible, laboratory experiments confirmed by radioactive tracer studies show, Prof. Theodore T. Puck of the University of Colorado Medical Center, Denver, finds.

Viruses are the causes of a wide range of diseases from poliomyelitis to the common cold. Prof. Puck's studies were made with a virus that does not cause human disease but is representative of viruses in general and is suitable for laboratory experiments.

The virus attacks the cell by a two-step process, Prof. Puck found. In the first step, attachment to the cell results from a purely electrical attraction governed by charged metallic atoms, or ions, normally present in the cell's environment. Introducing certain other metallic ions, not ordinarily present, blocks this attraction.

In the second phase of the attack, the virus becomes a part of the cell. This step cannot be reversed. The length of the period between the first and second steps, during which the ionic counter-attack must be made, is not yet known.

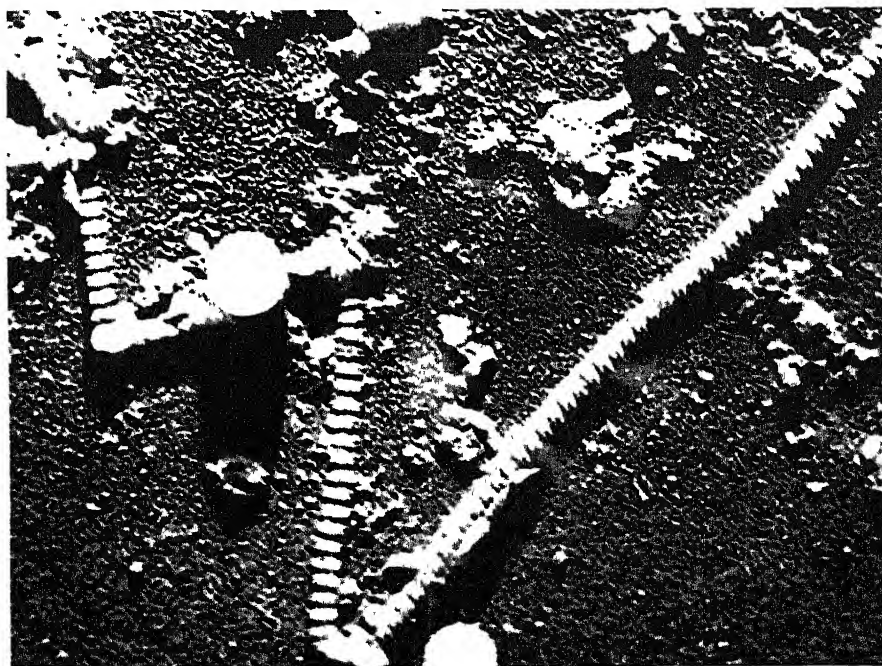
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BIOLOGY

Previral Units Are Forerunners of Virus

➤ A NEW theory of how disease-causing viruses multiply within the cells of the body was announced by Drs. Geoffrey Rake and Harvey Blank of the Squibb Institute for Medical Research, New Brunswick, N. J., and the University of Pennsylvania and Children's Hospital, Philadelphia, at the Fifth International Congress for Microbiology in Rio De Janeiro, Brazil.

In the early stages of virus multiplication, according to the new theory, there are "previral units." These are smaller than



NUCLEOPROTEIN "EARTHWORM"—The electron microscope photograph shows a section of a nucleoprotein thread, indispensable substance of life, from cells in the spinal cord. Nucleoproteins are also found in viruses. The "earthworm" segments measure two millionths of an inch in length, and the white balls are signposts of artificial rubber which are added to the preparation for purposes of measurement.

the fully formed virus particles with which scientists have previously been familiar.

The fully formed virus particles seem to be made up of a number of previral units around which a matrix of other material forms.

This picture of how viruses multiply within the cell was developed from studies with the virus of *molluscum contagiosum*. This is a skin disease affecting only the superficial layers of the skin. The virus producing it has characteristics placing it in the group of pox viruses which produce such diseases as smallpox, chickenpox and, in animals, cowpox. The surface skin lumps produced by this virus develop slowly

and are benign in nature. This makes it easy to obtain large amounts of material for examination.

New and delicate methods of tissue stainings were applied to the infected cells and fragments of cells affected by this virus. They were then examined under the electron microscope. From these studies came the new theory of virus multiplication. It is considered of great theoretical importance because heretofore very little has been known about the early stages of the multiplication of viruses inside cells, with the exception of bacteriophages, which are viruses that prey on bacteria.

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AERONAUTICS

Private Planes in War

➤ THE part that American private planes can play in total or partial war emergencies is outlined in a special report just made to the U. S. Civil Aeronautics Administration by a committee of 12 experienced airmen.

This nation's non-scheduled aviation industry is an irreplaceable reservoir of talent and equipment of tremendous potential value in the defense of the United States, the report states. There are more than 60,000 active aircraft, almost one-half million trained pilots and some 5,000 operating non-military airports in the United States.

These rich civil aviation resources of the nation must be preserved and encouraged so that they will be available to military and civilian defense agencies as the need arises, the committee declares. The majority of airmen accepts the principle that internal security is the most important consideration involved in all flight operations and that certain steps should be taken immediately to guarantee that security.

During a period of active air defense

there are two particular problems of military concern. The first is the positive identification of all aircraft operating within "sensitive" military areas. The second is the prevention of unauthorized use of civil aircraft for purposes of sabotage or espionage.

Sensitive military areas are those where a continuous watch by radar tracking and ground observation is maintained. To prevent sabotage or espionage, satisfactory controls covering security clearance of airmen, operational controls and identification of aircraft are essential.

Among various suggestions made by the committee is the installation of equipment on aircraft so that air-to-ground communications on very high frequency channels may be maintained. It is also recommended that all pilots carry an identification card containing fingerprints, photograph, full name, signature and personal description.

Registration with a State Defense Council or "control airport" should be required for all aircraft, the report states. All pilots

should, if possible, file flight plans. Some of the recommendations will be implemented at once, D. W. Rentzel, the head of CAA, announces.

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● RADIO

Saturday, September 23, 3.15-3.30 p. m. EDST

"Adventures in Science" with Watson Davis, director of Science Service over Columbia Broadcasting System.

Mr. Davis will discuss "The First National Science Fair" with educators and finalists.

SCIENCE NEWS LETTER

VOL. 58 SEPTEMBER 16, 1950 No. 12

44,400 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W. Washington 6, D. C., NORTH 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00, 3 yrs., \$14.50, single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STATE 4439.

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PSYCHOLOGY

Sculpture Aids Blind

Orientation depends upon putting individual impressions together to form a meaningful whole. The art of the blind falls into either the visual or haptic types.

➤ BLIND people can be helped to find their way around by teaching them sculpture. Prof. Viktor Lowenfeld of Pennsylvania State College told the American Psychological Association in State College, Pa.

Orientation in seeing persons as well as in the blind depends, he explained, on the ability to put fragmentary impressions together to form a meaningful whole.

If you get lost as you make repeated turns in a strange city, it is because you do not retain the impression of all your various turns long enough to get a visualization or mental map of your travels.

Prof. Lowenfeld's findings come from a five-year study of the art of the blind.

When a blind artist works on modeling a head, he does not work with the head facing him as a seeing artist does. He stands behind the statue and reaches around it to model the features.

The majority of the blind do not begin, as does the seeing artist, with a single lump of clay and work it to form the various features. Instead they begin with separate parts for chin, mouth, nose, forehead and so on, and put them together without trying particularly to make them into a realistic or coherent whole.

In fact, the size of a single feature, such as the eyes, may be exaggerated with its importance to the artist. The hands of a violin player may be shown as enormous.

Most children's art is like that of this type of blind artist. Expressionism may also belong to this same type.

This type of blind artist is not concerned with the appearance of the world; he gives expression to his body feelings and his emotions rather than attempting to copy what he discerns with his touch or other senses.

Inside the mouth he will model the tongue, teeth and even the tonsils, because he knows they are there, although they are hidden by the closed mouth in the finished statue.

Other blind artists work like those with sight. They start with a single lump of clay representing the head and then form in it a cavity for the mouth, a nose, forehead, eye sockets and eyes, lids, eyebrows and wrinkles. Although they cannot see, Prof. Lowenfeld calls these the "visual" type because they work as do seeing artists.

The "haptic" type, representing about 65% of blind artists, begins with a part and not with a whole lump and often leaves a hole in the top of the head as it is formed so as to push out the eyeballs from the inside.

Prof. Lowenfeld's study of the art of the blind led to his tracing the development of art imagery. When the individual, whether blind or seeing, first begins to express himself through art, he produces a

vague total form without accurate details. The crude drawings of the cavemen were of that type.

In the second stage of development, the artist becomes aware of details and out of his urge to formulate them, makes his drawings or sculpture with geometric precision.

Later still he graduates from this stage and develops his freedom from mere duplication of observed objects and is able to express his emotional relation to the observed world. From this stage are developed the various schools of art.

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GENERAL SCIENCE

More Flying Saucers

➤ YOU can expect another rash of flying saucer reports during the next couple of months. A new book about the mysterious objects will probably induce people to work up an interest again, and some of them will be seeing things in the sky.

This latest book, *BEHIND THE FLYING SAUCERS*, by Frank Scully (Henry Holt and Company) tops them all. Mr. Scully's previous books bear such scientific titles as *FUN IN BED*, *MORE FUN IN BED*, *JUNIOR FUN IN BED*, and *JUST WHAT THE DOCTOR ORDERED*. In his saucer book, he quotes a

mysterious and very anonymous "Dr. Gee" as saying he got right up close to four of the saucers. One of them, this nameless "Dr. Gee" is quoted as saying, flew away before he and his party could grab it.

Mr. Scully met his mysterious "Dr. Gee" through Silas Mason Newton, of Denver, Colo., an oil man who believes not only in flying saucers but also in an unconventional method of finding oil.

Mainly on the authority of this "Dr. Gee," Mr. Scully tells a fantastic science fiction tale about hundreds of flying saucers.



ART OF BLIND—The distorted figure of the wood-chopper depicts the sculpture of the blind in which the individual parts of the figure are fashioned with little attention to the figure as a whole. The face which portrays pain is an example of the visual type in which the facial features are considered a part of an integral whole.

from Venus made of a strange new metal. He says the little men who make up their crews have been casing this old world for many years. He claims that "magnetic experts," again nameless, believe they fly to the earth on magnetic waves of force which enable them to travel at greater than the speed of light. He claims that the Air Force spirited away three of these flying saucers that actually landed here, together with the bodies of 34 little men, 36 to 42 inches high. He tells all this with a straight face, evidently believing his shy "Dr. Gee."

Mr. Scully tackles Albert Einstein and

all other reputable physicists who believe that nothing can travel faster than the speed of light. However, he neglects to demolish the universally accepted theory that matter—presumably including flying saucers—traveling at the speed of light would have a mass that is infinite. Using the kind of thinking that is in this book, "Dr. Gee's" flying saucers, traveling on their way to the earth from Venus at greater than the speed of light, ought to be bigger than all of the universes put together, bigger than infinity.

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PSYCHOLOGY

Prevent War by Word War

The Russian people must be told that we are not the aggressor and that we do not want war. Short-wave radio sets must be carried behind the Iron Curtain.

➤ OUR best weapon to prevent war is psychological warfare, Dr. Gustav M. Gilbert, chief psychologist of the Veterans Administration Hospital at Northport, Long Island, told the meeting of the American Psychological Association, State College, Pa.

The Russian people do not want war. Show them that they are not threatened by the United States and they will have no sympathy with a war, Dr. Gilbert said. Dr. Gilbert has made a study of the psychology of dictators as prison psychologist at the Nuremberg trials where he talked daily with Goering and other Nazi leaders.

No dictatorship can withstand the wrath of the people, he stated.

Every dictatorship has rival factions. They are united only by fear and the imprisonment of their own propaganda.

The Germans were horrified at the atrocities committed by their leaders. When they learned, many committed suicide. The Russians would be horrified if they knew that their leaders are committing acts of aggression.

If, at the time of Munich, the German people had been made to see that Hitler was leading them into a disastrous war, he would have been overthrown in a matter of days.

But, so far as those behind the iron curtain are concerned, the United States is the aggressor until they learn otherwise. We should carry short-wave radio sets into territory behind the iron curtain, Dr. Gilbert advised. Just how this is to be accomplished is a problem of strategy, but it should be worked out, he indicated.

Goering foresaw our difficulties with Russia and spoke of it to Dr. Gilbert, he said.

"Just wait five years until Russia has the atomic bomb," said Goering with a smile. "I'll get a great kick out of watching how you handle that situation, looking from

heaven or that other place I am going to—the more interesting place."

Dr. Gilbert's speech was in acceptance of the Edward L. Bernays Award of the Society for the Psychological Study of Social Issues, meeting jointly with the American Psychological Association. The Bernays award is a \$1,000 U. S. Government bond given annually to the individual or group contributing the best action-related research

on the problem of reducing international tensions. It was presented to Dr. Gilbert for his recently published book on *THE PSYCHOLOGY OF DICTATORSHIP* (Ronald).

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ENTOMOLOGY

Dutch Elm Beetles Becoming DDT-Resistant

➤ BEETLES carrying the dreaded Dutch elm disease have been found to be building up an immunity to DDT and other potent insecticides in Stamford, Conn.

A new strain of the Scolytus bark beetle seems to be following the path of houseflies and mosquitoes that can become DDT-resistant, chief entomologist of the Bartlett Tree Research Laboratories, Dr. Stanley W. Bromley, reported.

This year, in trees saturated with insecticides applied over the residue of previous seasons, more beetles than ever before survived the poisonous sprays. Tests showed also that more and more larvae of the beetles were spending the winter without harm in the bark of elms that had been sprayed with DDT.

Dutch elm disease, introduced to the United States only 20 years ago, is now a major threat to the entire American elm population. At present, high-pressure, high-saturation DDT spraying is one of the mainstays in the battle to keep the disease under control.

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KINGSIPHON—The giant aluminum siphon for ditch and flood type irrigation systems delivers approximately 320 gallons per minute with a 6-inch head. Rated 62% efficient, this siphon is easy to handle as it weighs only 13 pounds.

PSYCHOLOGY

Cats Work, Play with Rats

These two animals, commonly known as "natural enemies", play and work together to get their food. The implications for the world situation are significant.

See Front Cover

➤ FOUR alley cats, straight from New Orleans' French quarter, where they had had practice in dispatching little alley rats, learned to cooperate with laboratory rats.

Cat and rat played together. They worked together. They ate the same brand of dog food from the same plate as shown on this week's cover of SCIENCE NEWS LETTER.

A motion picture of these "natural enemies" in peaceful life with each other was prepared by Tulane University psychologist Dr. Loh Seng Tsai, as a moral to humans. It was previewed before psychologists at the meeting of the American Psychological Association in State College, Pa. Dr. Tsai expects to show it later to delegates to the United Nations.

Dr. Tsai began his experiment with three little kittens, only three weeks old, and three young white rats. He put them all in a cage together where they learned to eat and live together. Then he taught them to work in cooperation. He paired them off—Kitty the cat and Mickey the rat.

Each pair was put into a cage. A wire screen separated them from a tempting dish of food. To get at the food, cat and rat must step simultaneously on two buttons, thus raising the screen.

At first they did not get the idea. Dr. Tsai put food on both keys to give them a clue. But both ate from the same key.

The cat almost caught on. He was play-

ing with the rat's tail and accidentally both keys were pressed, opening the way to the food. So the cat went on playing with the rat's tail, evidently thinking that solved the problem.

But the rat was smarter. He would attract the cat's attention with his tail and when the cat had his paw on his button, he would scurry over and press his own.

Each animal seems to realize that he needs the other's help to get the food, Dr. Tsai reports. One rat got his tail caught going into the test cage and later was reluctant to enter, hesitating in an outer chamber. The cat went back to the entrance and beckoned for his partner to come in and get on the job.

Later Dr. Tsai arranged the experiment so that one animal was held in the outer chamber, but the other animal could release him by pressing a button. Cat and rat both learned to press this button and lift the iron curtain, so that the other could come in and help.

Then the alley cats were brought in and fed with the rats. They, too, made friends and learned to work cooperatively with the laboratory rats.

Dr. Tsai believes that the implications of this experiment for mankind in this world of cold and hot war are obvious. "If the 'natural enemies', cats and rats, can learn to work together, why not unfriendly nations of men?" he asked.

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to make the sounds of all the vowels and a number of consonants. By the end of her third month, she would make such remarks in baby talk as "ah," "wha," "he" and "o."

But after four or five months her babbling stopped. At five months her formal speech training began. First she was taught to "speak" for her bottle, and she learned to bark, much as a dog will when trained.

When she was 14 months old, Dr. Hayes began moving her lips to form the word "mama." In two weeks she learned to say it. At first she could say it only when fingers were on her lips, but later she would put her own hand to her mouth when she made the sounds. Now she always brings her hand to her mouth to call her "mama."

In the following months, Viki began to make a number of sounds in play. One was like a whispered Bronx cheer. Dr. Hayes taught her to put two of these salutes together and to shorten them somewhat. This formed the basis of Viki's second word, "papa." She has learned to address Dr. Hayes with this word, but it is still whispered.

When she was 28 months old, she had learned to put another pair of sounds together to form another whispered word, "cup." This she says when she wants something to drink.

Dr. Hayes has tried to train two other year-old chimpanzees to talk, but without much success. One has learned to give a sort of bark to obtain food, the other can occasionally and with great effort produce a whine.

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PSYCHOLOGY

Viki, a Chimp, Talks

➤ A TALKING chimpanzee was introduced to psychologists at the meeting of the American Psychological Association through a sound movie that records her words.

The ape is Viki, three-year-old adopted "daughter" of Dr. Keith J. Hayes, of the Yerkes Laboratory of Primate Biology, Orange Park, Fla., and Mrs. Cathy Hayes. Viki wears dresses, plays like a baby and laughs when she is tickled.

Viki knows three words and can use them correctly. They are the same words that usually form the beginning of a human baby's vocabulary—"mama," "papa" and "cup."

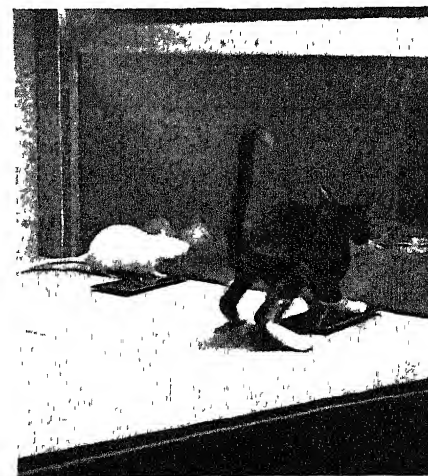
The reason that the ordinary chimpanzee cannot talk, Dr. Hayes concludes from his experience with Viki, is not anything defective in the voice box or other vocal

organs. It is not due to lack of intelligence—Viki has the mind of a three-year-old human child, tests show. Instead, the fault is something lacking in the center of the brain that, in man, controls speech.

Dr. Hayes believes that Viki can learn to speak more words, though only with great difficulty. In many ways, she seems like a human who has lost the power of speech because of injury to the speech center of the brain, but can understand much more than she can say.

Viki has lived for all three years of her life in the Hayes' home as their child. In the film she wears a little jumper dress and sits on a table or is carried in the arms of Dr. or Mrs. Hayes.

Her speech started with the ordinary childish babbling during which she learned



OBJECTIVE — FOOD — Kitty and Mickey, after some confusion as to how to get the food on the other side of the wire screen, found out that the buttons had to be stepped on simultaneously to raise the screen. Now they work together to satisfy their hunger.

CHEMISTRY

Spearmint Flavor Comes From Peels of Oranges

➤ CHEMISTS have now synthesized a spearmint flavor out of the peels of oranges and grapefruits.

The new product announced to the American Chemical Society meeting by Dr. Carl Bordenca of the Southern Research Institute in Birmingham, Ala., will supplement and partially replace the natural material in chewing gum and other materials.

Natural spearmint oil has been variable in supply and quality in recent years. The new process will utilize a by-product of the citrus canning industry. The chemical synthesized is carvone, which is a compound also present to the extent of 65% in natural spearmint oil.

Dr. Rufus K. Allison and Dr. Philip H. Dirstine, of the same institute, joined Dr. Bordenca in the research.

Science News Letter, September 16, 1950

METEOROLOGY

Russia and U. S. Still Exchange Weather Reports

➤ WEATHER is one of the few things on which Russia and the United States continue to agree. Despite the war in Korea, weather reports from Vladivostok and other stations close to the Korean border continue to be broadcast to the world four times a day.

We reciprocate—and from reports from all over the northern hemisphere both Russian and American weathermen make their forecasts. Sometimes reports, not only from Russian stations but from those controlled by this country, are delayed or do not come through at all.

U.S. Weather Bureau officials report, however, that there has been no deliberate stoppage on the part of the Russians, contradicting a recent Drew Pearson column.

Science News Letter, September 16, 1950

CHEMISTRY

Radioactive Adrenaline Traced through Body

➤ ADRENALINE, gland chemical famous as a lifesaving stimulant in many a dramatic case, has now been made with radioactive carbon from the Atomic Energy Commission's plant at Oak Ridge, Tenn.

Synthesis of the radioactively-tagged compound was reported by Dr. Richard W. Schayer of the Rheumatic Fever Research Institute, Northwestern University Medical School, at the meeting of the American Chemical Society in Chicago, Ill.

Adrenaline is converted into at least five substances in the body, studies with the radioactive form suggest. From his findings

so far, Dr. Schayer described the fate of adrenaline injected into the body as follows:

"Adrenaline is removed from the blood by the body tissues, where it is converted into one or more new substances differing in properties from the original adrenaline. The new substances are then released from the tissues back into the blood stream, from which they are picked up by the liver and kidney for possible further change and excretion.

"The identity of the substance or substances found in high concentration in the blood is of interest and will be investigated in later studies," Dr. Schayer stated.

Science News Letter, September 16, 1950

INVENTION

Shower and Dress On the Beach

➤ COMBINATION dressing room and shower bath, a collapsible affair that can be carried to the beach under the arm and set up where wanted, is among inventions on which the government issued a patent recently.

When set up, it is a circular shelter, just big enough to hold one person. It has a base with uprights to support a surrounding curtain, and bucket of water overhead. The bucket is called a sprinkler pail, and has a stopcock to control the flow of water.

This invention is suitable for use by campers and others, the inventor, Franklin B. Brown of Los Angeles, claims. For his work he received patent 2,519,430. Guy ropes and pins may be used to hold the shelter upright during a high wind, he states.

Science News Letter, September 16, 1950

INVENTION

Trim Your Lawn with Used Razor Blades

➤ NOW you can trim your lawn with used razor blades too dull to shave your face. Used blades form the working edge in a grass cutting implement on which a patent was issued by the government recently.

The important part of the implement is an elongated holder to which a series of blades, end to end, are attached. An elevated handle at one end of the holder keeps the hand of the operator safely off the ground. Important is a flat metal shield, with its forward edge open, that fits over and under the blade holder.

When in use the blades project outside this open edge. But at other times the shield is slid in a reverse position over the blade holder where the cutting edge can do no damage to handlers.

This razor-blade grass-cutter brought patent 2,520,464 to Cornelius A. Hubner, Butler, N. J.

Science News Letter, September 16, 1950

CONSERVATION

California Forest Fire Danger Is High

➤ CALIFORNIA forestry officials sat on the "most explosive fire season in 26 years" as deer hunters oiled their rifles and prepared to take to the woods on Sept. 16.

Listed by the U. S. Forest Service as the driest state in the union, California has already had more than 4,000 forest and range fires this year. They have claimed six lives and burned more than 200,000 acres, to a total estimated damage of \$5,000,000.

Perry A. Thompson, U. S. regional forester, and DeWitt Nelson, state forestry chief, warned that the forest fire danger is now at its peak. Months of dryness have left forests like tinder. Fires can travel a mile in a few minutes under such conditions, they said.

Science News Letter, September 16, 1950

INVENTION

Stainless Steel Given Many Colors by Chemical Process

➤ STAINLESS steel in many colors, for ornamental use and for interior fixtures and furniture, varies from yellow through green and blue to purple when treated chemically in a process which received a patent from the government recently.

This now widely-used, rust-resistant steel alloy is ordinarily of a dull or satin-like appearance if unpolished, but has a mirror-like metallic hue when finished. It can be painted, of course, but paint coatings are usually unsatisfactory because they do not tie in properly with the properties of the steel.

In this process, the colors are obtained by chemical action with the metal surface. The steel is immersed in a bath of water to which a small quantity of phosphoric acid has been added. The acid is by weight from 0.25% to 5% of the solution.

The steel remains in the solution for a period ranging from 20 minutes to 20 hours. A colored, thin, translucent, and usually somewhat iridescent, film forms on the surface. The bath is kept at about the boiling point. Full color is seldom obtained in less than 20 minutes, and appreciable changes in color are obtained up to 20 hours.

Patent 2,521,580 was issued to Regina L. Hornak, Baltimore, Md., and John J. Halbig, Middletown, Ohio, for the process. Rights have been assigned to Armco Steel Corporation, Middletown.

Science News Letter, September 16, 1950

MEDICINE

Exchange Resins May Put End to Salt-Free Diets

➤ **CHEMICALS** called ion exchange resins may put an end to the monotonous no-salt diet which many patients with dropsy from heart disease and other ailments must now follow

Good results with these chemicals in both animal experiments and trials on human patients are reported to the American Chemical Society in Chicago by two groups of scientists. Drs. Evan W. McChesney, Frederick C. Nachod and Maurice L. Tainter of the Sterling-Winthrop Research Institute, Rensselaer, N. Y., and Drs. A. E. Heming, T. L. Flanagan and M. F. Sax of Smith, Kline and French Laboratories, Philadelphia.

Dropsy, or edema as doctors term it, is an accumulation of body fluid. It occurs in cases of congestive heart failure, cirrhosis of the liver and some cases of high blood pressure. The fluid accumulates because the body is unable to get rid of enough sodium, such as is contained in common table salt.

Drinking large amounts of water to wash out the salt and at the same time reducing drastically the intake of salt have been measures used to overcome the dropsy.

Using the same principle developed during the last war to remove salt from sea water to make it drinkable, the two groups of scientists have developed special ion exchange resins to remove salt from the patient's body.

In order to avoid robbing the body of potassium as the sodium is being removed, a combination of ammonium and potassium forms of the resin was adopted by Dr. Heming and his associates.

The "cation exchange resins" used to remove salt in dropsy cases should not be confused, Dr. Heming pointed out, with "anion exchange resins" used in treating stomach ulcers. The latter type work by "binding" the acid in the stomach.

Science News Letter, September 16, 1950

PSYCHOLOGY

Quarter Looks Bigger to Rich Child than to Poor

➤ **A QUARTER** looks bigger to a ten-year-old rich child than it does to a poor child, Drs. Bernard G. Rosenthal and Janice Houghton Levi of the University of Chicago told the meeting of the American Psychological Association in State College, Pa.

This is true also of other coins—a penny, a nickel, a dime and a half dollar. It is the same whether he has the coin on hand

or whether he is making the judgment from memory.

The ten-year-olds tested by the psychologists made their judgment by adjusting the size of a circle of light on the screen of a box until it matched his idea of the size of the coin.

Rich children as compared to the poor showed a greater tendency to say that they would spend money on themselves rather than on others. And more rich children said that they would rather save their money than spend it.

Science News Letter, September 16, 1950

METEOROLOGY

Weather Flashes On Broadway

➤ **WEATHER** matters less on Broadway than most places. Nevertheless the newest Great White Way sign advertising a life insurance company translates the official forecast into steady green for sunshine ahead, steady orange for clouds expected, flashing orange for rain and flashing white for snow. Future temperature changes are shown by jumps in bands of light.

Science News Letter, September 16, 1950

CHEMISTRY

Tartaric Acid From Coal Product

➤ **BAKING** powder can now be made from wholly American materials, thanks to the commercial synthesis of tartaric acid. This ingredient has previously been made from deposits that form during the aging of French wine.

Prof. James M. Church of Columbia University's chemical engineering department told the American Chemical Society in Chicago that tartaric acid should soon be made as cheaply from benzol, a coal-tar product, and hydrogen peroxide, as it can be recovered as a by-product of the European wine industry.

Chemical manufacture of tartaric acid was stimulated by the shortage of tartrates and the high prices of the wine industry product that followed World War II. Obtaining natural tartaric acid as a wine by-product is a slow and complicated process, involving much labor and handling of materials in southern France. Users of the chemical in the United States were affected by the fluctuations of the wine industry and tariff regulations.

Chemical manufacture of tartaric acid begins with a similar chemical structure, maleic anhydride, which is made from coal-tar benzol. Combined with hydrogen peroxide in the presence of a little tungsten oxide as catalyst, a water solution of the maleic anhydride gives a pure tartaric acid that can be crystallized out simply.

Science News Letter, September 16, 1950

CHEMISTRY

Antibiotics May Fight Fungi and Insects

➤ **INSECTS** and fungi in the future may be fought with the same kind of materials, antibiotics, that are saving human lives by the thousands from a whole array of infectious diseases.

A new antibiotic with high potency as a fungicide was reported to the American Chemical Society by Dr. John Little of the Vermont Agricultural Experiment Station, Burlington, Vt. Isolated from the roots of a tropical flowering plant, *plumeria multiflora*, it is called plumericin.

Chemists are searching for new chemical fighters of disease in all sorts of growing substances. The prime hope is that new antibiotics will prove more effective against diseases already combatted by penicillin, streptomycin, aureomycin, etc., or against ills untouched by them.

Some of the new substances prove too toxic to human beings to be used medically and these, if they can be made cheaply enough, may prove useful in the war against insects, mildew, molds and other pests that affect the things man uses instead of his health.

Another antibiotic, netropsin, obtained from the same family of organisms that produces streptomycin and terramycin, was reported by Chas. Pfizer and Co. chemists as a promising weapon against clothes moths and carpet beetles.

Science News Letter, September 16, 1950

MEDICINE

Ultrasound, Unheard, Hits Nervous Tissues

➤ **ULTRASOUND**, which cannot be heard by human ears, affects nerves more than any other tissue of the body, Dr. Warren A. Bennett of the Mayo Foundation, Rochester, Minn., reported in Boston to the American Congress of Physical Medicine.

The findings came from studies in which dogs with spontaneously occurring tumors were treated with ultrasound. Scientists at the Mayo Clinic and Foundation are trying to learn whether ultrasound waves can disintegrate cancers and other tumors and whether the way in which these high frequency sound waves are reflected can be used to detect cancers.

"The destruction due to ultrasound," Dr. Bennett reported from his experience in treating dogs, "depends on the duration and intensity of treatment along the type of tissue through which the sound passes. The lack of destructive selectivity has led to the destruction of normal tissues as well as the tumor. Marked changes appear to be irreversible."

Science News Letter, September 16, 1950

ENGINEERING

U. S. Pumps Oil for Korea

Oil production has been upped to meet the demands of the Korean war effort. Military demand during peace is only four to five per cent of the total domestic demand.

By WADSWORTH LIKELY

➤ SO far as petroleum is concerned, this country is well set for a war, partial or all-out. But a war will bring much nearer the day when we must use great quantities of liquid fuels from coal and oil shale and synthetic gasoline from natural gas.

Right now runs of crude oil through the refineries are moving up to 5,800,000 barrels a day and may go up 400,000 more barrels a day before the end of the year. Domestic petroleum production from the wells is almost up to the all-time high average set in 1948 of 5,520,000 barrels a day.

Production has been down during the past two years. During the first quarter of 1950 it was held down to 5,000,000 barrels a day, but the levels have been brought up because of the Korean crisis.

During the five years of so-called peace, the military demand has been four to five per cent of the total domestic demand. This, naturally, will be stepped up. But the step-up, in some case, may be disguised because certain factories which use petroleum may be taken off civilian work and put on defense work. Ships, too, using fuel for civilian freight, will be shifted over to carrying troops and supplies, with little real increase in the demand for petroleum in that category.

If our Air Force is greatly increased, the demand for aviation fuel will jump. In 1940, as an example, we manufactured 15,000,000 barrels of aviation gasoline a year. In the peak war year, 1944, we produced 200,000,000 barrels.

Civilians felt this huge jump in gasoline rationing. We cut automobile consumption of gasoline 35 to 40 per cent. Last year, we used 772,000,000 barrels of gasoline on the nation's highways.

More Gas for Pilots

Immediate jumps in demands for aviation fuels will be felt if we start a new pilot training program. Bombing and strafing trips from Japan to Korea have not cost so much in fuel as did the thousand-plane raids from England into the heart of Germany.

So far, the west coast has been most affected petroleum-wise. There has been a stepping up in California operations, and no longer is that oil-rich state considered to have an oil surplus above ground. Shipping of petroleum and petroleum products from California around to the east coast is being stopped.

The demands for petroleum in a partial or an all-out war depend, of course, on the kind of war it is. In World War II, we sent millions of men overseas and tons of supplies, both for our men and for our allies. This meant a big increase in the demand for ship fuels and aviation gasoline for air transports.

Once in Europe, we depended largely on trucks and planes to move our troops and supplies. World War II was costly so far as petroleum was concerned.

Lavish Gas Use in War

The United States used petroleum quite lavishly. Troops burned gasoline from motor pools to make heat for washing "appropriated" clothes and cooking food. Economical feeding of gasoline to plane motors was merely a technique to increase the range of our fighter craft, not to save precious fuel.

Man for man we used many more gallons of gasoline and oil than did our allies. Our enemies were even worse off. Vital progress was made in synthetic fuels in Germany because of the unavailability of the real stuff.

Prime reason for the early Japanese drive southward into Indonesia was the supply of oil there. And a prime reason for the Japanese defeat was that our submarines and planes and surface ships succeeded in virtually cutting off the Japanese homeland from those oil supplies.

Today, in addition to sending fuels directly from the west coast, we may well be purchasing Indonesian production for our troops and planes in the Far East.

Demand for petroleum and its products has risen prodigiously in this country. The end of World War II brought no appreciable decrease in this demand, as our factories got into high gear for the greatest civilian production in our history and as more cars got onto the roads than ever before.

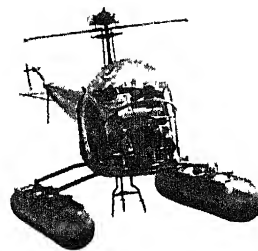
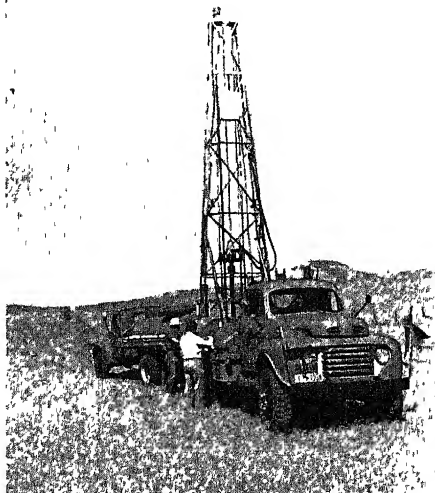
In 1940, domestic demand for petroleum was a little over one and a third billion barrels; in 1948, two and one-tenth billions. In 1944, presumably the peak war year for petroleum, we demanded and got almost one and seven-tenths billion barrels.

No one knows just what percentage of this demand can be attributed to our military needs. Figures are still not very complete and, in addition, it is sometimes hard in wartime to say what is military and what is civilian.

More Drastic Rationing

If there is another all-out war, and if it does entail the carrying of large numbers of troops and tons of supplies overseas plus a large air effort, we may expect a more drastic curtailment of purely civilian use of gasoline and oil. In addition, the military may be expected to use what petroleum it is given more economically.

Current proved reserves—the petroleum we know is under our ground—is about 28,000,000,000 barrels, the highest in our history. We continue to find more every year—both underground and under the



OIL SEARCH—ON THE LAND, IN THE AIR—Land searchers for oil, drill truck and water truck men, prepare to drill a shot-hole for dynamite while in the air a helicopter equipped with a magnetometer measures variations in magnetism, thus gaining clues to the presence of oil-bearing formations



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waters around our shores

In addition there are hundreds of billions of barrels hidden in oil and tar shale, waiting on their need and on more economical methods of getting them out. Progress has been made in extracting liquid fuels from coal. And every year millions of dollars are being spent on research in synthetic fuels.

Farther in the future is the use of atomic power to propel our ships and planes. Research is being done now on the possibilities of providing a submarine with an atomic motor.

Although even a new all-out war may not make necessary our dependence on these new sources of petroleum, these new methods of mobile power, it will bring much closer the day when we will have to produce them and use them in peacetime. There is only so much oil under the ground.

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MEDICINE

Med Schools Alerted On A-Bomb Courses

➤ A STRONG hint to the nation's medical schools to consider atomic explosions and other military medical matters promptly if they have not already done so appears in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Sept. 9).

The hint comes in the Association's fiftieth annual report on medical education in the United States and Canada. The report was written late in August. At that time, "it was not possible to forecast the impact of the United Nation's police action in Korea on medical education in the United States."

But, the report goes on to state, "it does seem clear that without further delay medi-

cal schools will want to review their curricula to determine how increased emphasis can appropriately be placed on such subjects as military medicine, public health and civilian emergency relief, including the prevention and treatment of casualties from atomic explosions.

"Planning for the dispersal and evacuation of medical schools in the event of bombing of American cities is another topic to which the medical schools will undoubtedly address themselves in the months ahead."

More than 7,000 students are expected to enter medical schools as freshmen this fall. Last year's freshmen class was 7,042, an increase of 53% over the preceding year and an increase of 17% over the average size of the freshmen class in the 10 years preceding World War II.

Medical schools also now have fewer vacancies in the teaching staffs.

Minimum cost to students of attending medical school for one school year, including tuition, other fees, books, equipment, essential living and travel expenses, ranges from \$567 to \$2,252.

Fees charged the student for tuition will average \$554 during the year 1950-1951. But the students' fees will provide less than one-fourth of the budgets of the medical schools, which for the current year total about \$67,500,000.

These budgets have increased by 42% over the last four years. While a number of schools still are having difficult financial problems, the American Medical Association finds that schools have a record of improved support.

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PSYCHOLOGY

Thirties Best Years For Creative Work

➤ INCREASING the average length of life will result in a greater creative output on the part of our geniuses. But the most fruitful years of creative work will still be those between 30 and 39.

This is the conclusion of Dr. Harvey C. Lehman, of Ohio University, based on a study of the contributions of large numbers

of creative thinkers. His results were reported to the American Psychological Association.

Those who live to be 85 years old and those who die at 50 both do their best work in their thirties, Dr. Lehman told the meeting. But with greater longevity, the average output is somewhat greater, the average age at time of achievement is greater, and a smaller proportion of total production occurs during the best years.

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PSYCHOLOGY

Twice-as-Fast Speech Found Intelligible

➤ IT is possible to understand speech at a rate twice as fast as it is ordinarily spoken, the American Psychological Association learned in State College, Pa., from a report by Dr. Richard H. Henneman of the University of Virginia.

Telephone conversations can be shortened and transmission time saved by transmitting a canned, condensed version of the speech, Dr. Henneman reported. In an experiment, a magnetic tape recording was made of separate words and of a sentence intelligibility test. Then by cutting and splicing the tape, various speed-ups were obtained.

For continuous speech the intelligibility did not drop appreciably until the speed was more than double. When the intact tape was run faster so that the frequency, or pitch of the voice was changed, intelligibility dropped to 65% at double the speed.

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MEDICINE

New Cortisone Synthesis

➤ AN IMPROVED method of synthesizing cortisone, which promises to increase the supply of the now scarce arthritis remedy, was announced by Dr. E. C. Kendall and four Mayo Clinic co-workers at the meeting in Chicago of the American Chemical Society.

The nation's seven million or so arthritis sufferers probably never have heard of osmium. This is a very hard, gray metal which gets its name from the strong odor of one of its oxides. But the smelly hard metal in one of its forms, osmium tetroxide, has heretofore been necessary for the synthesis of cortisone.

Now Dr. Kendall and associates have found a way of making cortisone from bile acids without using osmium tetroxide.

"Cortisone may be made more cheaply and abundantly as a result," he declared.

Currently, he explained, "such large quantities of osmium are required and the supply is so limited that all pharmaceutical companies which would like to manufacture cortisone cannot secure the necessary amount of this rare element."

Osmium is not only expensive and rare but also toxic, so one part of the synthesis now followed required the recovery of all traces of osmium used in making cortisone.

Key to the preparation of cortisone is the introduction of what chemists call a hydroxyl group into the proper molecular position. It must be attached to the seventeenth carbon atom in a compound known as a pregnane derivative, which is extracted from cattle bile.

The new synthesis was accomplished by following precise chemical preparations of a series of intermediate compounds. The steps had to be delicately timed so that it was possible, through skillful manipulation, to remove the hydroxyl groups that entered the wrong positions, without removing the desired group. The success of this method is the culmination of four years of research work at the Mayo Foundation.

"The results could not be predicted," Dr. Kendall stated. "The achievement is a source of much satisfaction."

"The discovery of this series of intermediate compounds may be of no little significance in the large-scale production of cortisone. The sequence of steps can be applied to starting material other than that used in the work described in this paper and the ability to introduce a hydroxyl group at C-17 in derivatives of pregnane without the use of osmium tetroxide may remove a formidable block in the commercial production of cortisone."

Associated with Dr. Kendall in this work were Drs. Frank B. Colton, William R. Nes, David Van Dorp and Harold L. Mason.

Cortisone made without osmium has been produced in a radioactive form so that more

can be learned about the path this drug takes through the body and, perhaps, how it acts to relieve arthritis and other ailments.

This feat was announced by Drs. T. F. Gallagher, Theodore H. Kritchevsky, David Fukushima, Bernard Koechlin and Max Eidinoff of Sloan-Kettering Institute and

NUCLEAR PHYSICS-GENETICS

Atom Alters Heredity

➤ DEFINITE proof that the atom bomb can alter plant heredity—and hence also the genetic legacy handed down by human atomic victims—has come from tiny seeds of cotton, barley and wheat brought back from Bikini.

Results of four years of experiments with seeds exposed to the atom bomb on the decks of the Bikini target fleet have been published in the JOURNAL OF HEREDITY (May) by scientists at Texas A. & M. College and the State College of Washington.

"From the standpoint of human welfare, proof that ionizing radiation released through the explosion of an atomic bomb can cause breaks in plant chromosomes means that human and animal chromosomes, as well as all others, are also liable to the same kind of injury," Dr. Meta S. Brown, Texas A. & M. specialist in genetics and the biology of individual cells, writes.

The Texas research showed that cotton grown from Bikini-radiated seeds had irregularities in the vital pairing of its chromosomes which could be attributed only to the atomic radiation.

From Pullman, Wash., Dr. Luther Smith reported similar changes in barley, wheat and oats. Both experiments were conducted as part of a long-term investigation by the Navy and the Agriculture Department into

Memorial Hospital, New York.

Radioactive tritium was substituted for hydrogen in one stage of the synthesis to produce the radioactive cortisone.

Four other adrenal cortex hormones were also prepared and were made also with the stable isotope of hydrogen, deuterium, in the molecule. These hormones are also expected to aid in the study of the part these hormones play in fighting disease.

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the biological effects of the A-bomb.

The cereals, Dr. Smith pointed out, had received the equivalent of 16,000 units of X-ray radiation, which is far more than a human being can take and still live.

Nevertheless, said the Texas report on cotton, "there is the possibility of hidden changes in chromosome structure which constitute a potential threat to the fertility of the individual (human being)."

"It has been repeatedly demonstrated that translocations and other structural changes in chromosomes have an adverse effect on the fertility of plants and animals," Dr. Brown reported.

Experiments such as these undoubtedly were the scientific backing for a warning on possible genetic changes published recently by the Atomic Energy Commission and Department of Defense in its handbook, THE EFFECTS OF ATOMIC WEAPONS.

"There is a large body of data which indicates that any dose of radiation, no matter how small, increases the probability of genetic changes," the AEC handbook said. To lessen the risk of passing on changes in chromosome structure, it advised atomic victims to "refrain from begetting offspring for a period of two or three months following exposure."

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MEDICINE

ACTH Saves Burned Man

➤ ONE of the wonder drugs relieving arthritis, ACTH, promises to become a lifesaver for badly burned soldiers and civilians who otherwise would die.

The American Chemical Society, discussing the chemical structure of this drug extracted from pituitary glands, heard of a case in Phoenix, Ariz., of a man badly third-degree-burned in an oil fire who was given ACTH with complete recovery after skin grafts. Without ACTH the man would have undoubtedly died, but the anti-arthritis drug prevented fluid loss, toxemia and muscle damage usual in such severe burns.

Armed service experts heard of the case, which was handled by Dr. Maurice J. White-

law, and observed it. As a consequence those handling ACTH production expect that it will be used medically at the fighting front. This may even slow down the application of the drug for treating arthritis and other diseases among civilians.

One of the newer uses of ACTH has been to combat acute alcoholism.

Dr. D. F. Waugh of the Massachusetts Institute of Technology reported to the chemists that the weight of the ACTH molecule was much smaller than previously supposed, between 1,000 and 1,300, that is, 1,000 to 1,300 times the weight of the hydrogen atom. This means that structure of ACTH is considerably simpler than

the

supposed previously, containing only a half a dozen different amino acids as building blocks. This gives the chemists new hope that eventually they will be able to manufacture ACTH artificially rather than obtain it from the pituitary glands of hogs which are in short supply.

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MEDICINE

Cortisone, ACTH Shield Against Arthritis

► CORTISONE and ACTH act as shields against the fire of whatever it is that causes rheumatoid arthritis. But they "do not put out the fire nor act as carpenters to repair the fire's damage," Dr. Howard F. Polley of the Mayo Clinic, Rochester, Minn., declared at the American Congress of Physical Medicine in Boston, Mass.

For repairing the damage of deformed joints and wasted muscles, doctors who specialize in physical medicine, called physiatrists, are still needed.

"The means by which cortisone and ACTH produce their anti-rheumatic effect is not yet known," Dr. Polley said.

"They do not kill germs. Neither do they 'cure' diseases the symptoms of which they may so profoundly modify. But in some unknown manner they provide susceptible tissues with a shield against a wide variety of irritants."

When stiffness of joints and pain are relieved, patients can be further helped by exercise, heat, hydrotherapy and other kinds of physical therapy. Physical medicine can also help patients who cannot be given enough cortisone or ACTH to control the arthritis completely.

Dr. Polley warned, however, that joints which have long been inactive or crippled should not be rehabilitated too fast or strenuously. Sudden increase of activity can cause broken bones. Exercises should be started gradually and carefully, even when relief from pain makes the patient ready to try anything.

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MEDICINE

Cortisone Cost Cut to One-Fourth Former Price

► PATIENTS getting cortisone for rheumatoid arthritis and other conditions now will pay only one-fourth the price they had to pay one year ago when it first became available for clinical research.

Merck and Co., manufacturers of cortisone under the trade name of cortone, announced that the price to hospitals will be \$50 per gram. In August, 1949, the price was \$200 per gram. This price cut, the fifth in the past year, results from improvements in production which have significantly increased the yield of the chemical as well as reduced production costs.

Good supplies of cortone are now available to 6,500 hospitals which meet certain requirements. At present the drug is to be used in the beginning stages of treatment only in patients treated in these institutions. After the initial treatment, however, the doctor may give continued treatment in his office or the patient's home.

The amount of cortisone given a patient varies, so it is difficult to state exactly what the new price will mean to an individual patient. After a higher dosage at the start, the patient may be put on one-tenth of a gram per day or even every other day. The cost to hospitals for maintenance dosage is figured at \$2.50 to \$5 per day.

More than 3,000 patients with rheumatoid arthritis have now been treated with this drug, with a prompt let-up of all signs and symptoms of the disease in practically every case. In addition, the hormone chemical has been used to bring striking improvement in acute rheumatic fever, bronchial asthma, early stages of disseminated lupus erythematosus, Addison's disease, inflammatory eye diseases, and many skin disorders including pemphigus, angioneurotic edema, atopic dermatitis and exfoliative dermatitis and cases of skin trouble due to drug reactions.

Science News Letter, September 16, 1950

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PSYCHOLOGY

"Democracy" in New York Times, Pravda Means Same

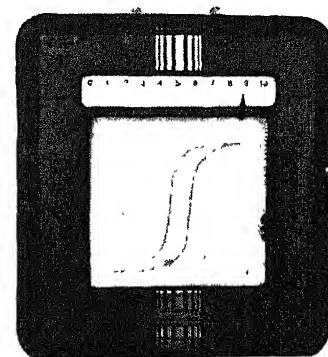
► BELIEVE it or not, the word democracy does mean the same when used by Stalin as it does in the writings of Lincoln.

A study of the context in which the word was used in Russian writings of Marx, Lenin, and Stalin as well as in Pravda, New Times and the Cominform Journal was reported in State College, Pa., to the American Psychological Association by Dr. Ralph K. White, Washington, D.C., psychologist. He compared the meaning of democracy in the Russian texts with the same word as used by Jefferson, Lincoln, Roosevelt and in the New York Times, Life, and the Chicago Tribune.

The Soviet definition of democracy is not radically different, on the ideological level, from our own, Dr. White found. The difference is mainly in emphasis.

The idea that the Russians stress government "for the people" and not "by the people," is mistaken, Dr. White said. They stress both. What they do not stress is individual freedom—even on the ideological level.

Science News Letter, September 16, 1950



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A new Speedomax Recorder saves hours of data plotting by automatically drawing the relationship between any two variables instead of plotting just one as a function of time, as done by usual recorders. The new instrument has two high speed electronic circuits . . . one for each axis. In other respects, it's a standard Speedomax.

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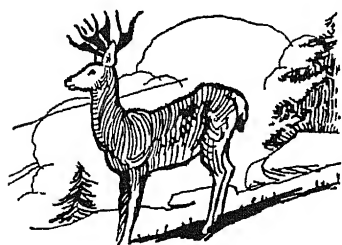
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WILDLIFE

NATURE
RAMBLINGS

➤ FROM earliest colonial days deer have been regarded by Americans with more affection than almost any other form of wildlife. Not only poets but the hunters who sought deer have praised their delicate beauty, quiet dignity and grace of movement.

When the white men first came to this country, the forests east of the Mississippi were full of one of the finest of all the species, the white-tailed or Virginia deer. This family is still the most widely-distributed, though it is outnumbered in certain areas by the black-tailed or mule deer.

The Indians were dependent upon deer. Deer gave the red man venison and pemmican for food, hides for warmth on winter nights, buckskin for clothing and antler-points for tools and ornaments. In their turn, the white men who pushed beyond the settlements became quite as dependent upon the deer as the Indian tribes who fought the Europeans' coming. French trader and English pathfinder were alike in this: Boone and Joliet both traveled in buckskins and moccasins.

The white-tailed deer led a hard life, stalked not only by men but by predatory animals such as wolves and panthers. Yet they held their own against them all.

But the long-barreled guns of the whites dispossessed the Indians and all but wiped out many forms of wildlife. It took a terrible toll of deer. The ax and the plow swept away the native wilderness and destroyed the deer's natural home over vast stretches of territory. Men saw no good in forests when the land could be used for farming. The destruction perhaps was inevitable, pioneering was rough work, and the settlers needed both land and meat.

The low point in the continent's deer population came and went with the turn of the twentieth century. By that time the reckless hunting by Americans, without thought of the consequence, was coming to an end. They began to make amends for past wrongs. Rigid hunting seasons were enforced, with strict limits on numbers of deer which could be taken.

Predatory animals had been all but pushed

into extinction. And the westward course of agriculture helped the deer to return. Abandoned farms, particularly in New England, returned to a semblance of the wilderness they once were. As the brush and trees came back, so did the deer.

Today, sportsmen see what their fathers thought would be forever impossible: a

growing number of deer, so many of them in states such as Pennsylvania that open seasons are occasionally possible—and also complaints by farmers, descendants of the bloody-handed pioneers, that deer are ruining their crops. The meek are inheriting the earth.

Science News Letter, September 16, 1950

PLANT PATHOLOGY

Fight for Lives of Elms

➤ SCIENCE'S battle to save the American elm is largely centered in the work of a famed research station on an elm-shaded residential hill in New Haven, Conn.

This month the Connecticut Agricultural Experiment Station, oldest in America, will celebrate its 75th birthday. Then it will go right back to its search for better ways to stop the deadly advance of Dutch elm disease and phloem necrosis, two diseases which threaten the entire elm species in America with extermination.

Both diseases are spread by insects. The elm-bark beetle leaps from tree to tree with the fungus of Dutch elm disease on its body. A leafhopper carries phloem necrosis. The seriousness of the elm's plight was underscored by the U. S. Department of Agriculture recently in the announcement that Dutch elm disease, introduced to this country in 1930, has now spread from New England as far west as Colorado and as far south as Virginia.

To fight the insect "vectors" carrying the twin blights, high pressure, high dosage DDT sprays are used. When the blast of

chemical mist is enough to completely soak the foliage of a tree, the job of protection is about 40% done, Connecticut plant scientists have learned.

The other string in the bow of elm rescue is chemical treatment of the roots. This chemotherapy is aimed at controlling the fungus of Dutch elm disease. It has proved one of the most promising approaches to date. Applied with an injection nozzle under pressure, chemicals such as 8-quinolinol benzoate have in many cases protected healthy trees from infection. But even such drastic treatment will not usually cure a tree already sick.

Neither chemotherapy nor DDT gives an absolute answer to Dutch elm disease. No tree stricken with phloem necrosis has been known to recover. One hope for the future are strains of disease-resistant elms being studied by the USDA.

But worried scientists are concentrating on ways to save the present generation of elms, knowing that a new generation of hardier elms may come too late.

Science News Letter, September 16, 1950

METALLURGY

Americium Is Light

➤ A HEAVY metal that is much lighter than expected has come to light with the metallic isolation of the universe's 95th element, americium, announced in Chicago, Ill., to the American Chemical Society by Dr. Edgar F. Westrum of the University of Michigan.

Plutonium, the modern A-bomb element, is number 94 and heaviest substance among the 98 elements known. Americium, just obtained in its silvery metallic form, has only about half its parent's density.

This means that even though americium's atomic weight is greater than that of plutonium, two bricks of americium would be necessary to counterbalance one of equal size made of plutonium. This is because inner forces give the americium atom a more expanded structure.

At least five new chemical elements beyond californium, number 98, will be discovered in the future, Dr. Glenn T. Seaborg, University of California chemist and

plutonium's discoverer, predicted in an interview in Chicago.

He is able to predict the chemical properties of the rest of what is called the actinide series, which ends with the element 103 whose atomic weight will be 267. Elements beyond 95 may be lighter than plutonium and uranium, if the tendency toward lower density shown by americium continues.

Only 5,000 atoms of the most recently discovered element, californium, existed, Dr. Seaborg said, and future new elements manufactured out of transuranium elements will be even rarer.

It is not known whether this process of synthetic building of elements duplicates ancient elements, long extinct, that once existed on earth or whether man has now gone nature one better and made material that has hitherto been impossible.

Science News Letter, September 16, 1950

Books of the Week

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ANNUAL REPORT 1949—*National Mental Health Foundation*, 24 p., paper, free upon request to publisher, 1520 Race St., Phila. 2, Pa

BEHIND THE FLYING SAUCERS—Frank Scully—*Holt*, 230 p., \$2.75 A supposedly serious argument in favor of the existence of flying saucers (See SNL, Sept 16, p 181.)

BOTANY. An Evolutionary Approach—R. Darnley Gibbs—*Blakiston*, 554 p., illus., \$6.00 An introductory college text

CATS—Wiltid S. Blomson—*Harcourt, Brace*, approx 77 p., illus., \$2.00. The characteristics of the many types of cats are described and explained. Delightfully illustrated

CHANCE AND CHOICE BY CARDPACK AND CHESSBOARD, Vol 1: An Introduction to Probability in Practice by Visual Aids—Lancelot Hogben—*Chanticleer*, 417 p., illus., \$12.50. A college text to be used in a course in statistical theory Well illustrated.

THE CHORDAILS—Heibert W. Rand—*Blakiston*, 862 p., illus., \$6.00 A general text on animals with backbones.

DAIRY CATTLE AND MILK PRODUCTION—Clarence H. Eckles—*Macmillan*, 4th ed., 560 p., illus., \$5.00 A general text revised by Ernest L. Anthony, a former student of the author.

ELEMENTARY TEACHERS GUIDE TO FREE CURRICULUM MATERIALS—John Guy Fowlkes, Ann Meyers and Paul T. Cody—*Educators Progress Service*, 7th ed., 343 p., paper, \$4.50. An up-to-date, annotated list of free maps, bulletins, atlases, pamphlets, exhibits, charts and books.

FATHER OF RADIO: The Autobiography of Lee de Forest—*Wilcox and Follett*, 502 p., illus., \$5.00.

FREUD DICTIONARY OF PSYCHOANALYSIS—Nandor Fodor and Frank Gaynor, Eds.—*Philosophical Library*, 208 p., \$3.75 A glossary of the basic terms in psychoanalysis as defined by Sigmund Freud.

THE HUMAN USE OF HUMAN BEINGS Cybernetics and Society—Norbert Wiener—*Houghton Mifflin*, 241 p., \$3.00 Dr. Wiener applies his theory of cybernetics, that is communication and control in the man and the machine, to our daily lives.

INTRODUCTION TO TEXTILE CHEMISTRY—Bruce E. Hartsuch—*Wiley*, 413 p., illus., \$4.75 A college textbook

AN INTRODUCTION TO THE EMBRYOLOGY OF ANGIOSPERMS—P. Maheshwari—*McGraw-Hill*, 453 p., illus., \$6.00. A study of the seed plants in their embryonic stages.

LINEAR INTEGRAL EQUATIONS—William Vernon Lovitt—*Dover*, 253 p., illus., \$3.50. The general theory of linear integral equations with some of the applications.

MACHINE SHOP METHODS—Lorus J. Milne—*Prentice-Hall*, 376 p., illus., \$5.00. Basic principles and methods of shop tools and machines.

MAN THE MAKER: A History of Technology and Engineering—R. J. Forbes—*Schuman*, 355 p., illus., \$4.00. This is the 15th volume

in Schuman's Life of Science Library

METALS AT HIGH TEMPERATURES—Frances Huid Clark—*Reinhold*, 372 p., illus., \$7.00 A reference manual on the properties of metals at elevated temperatures.

MID-CENTURY The Social Implications of Scientific Progress—John Ely Burchard, Ed.—*Technology Press of The Massachusetts Institute of Technology and Wiley*, 549 p., \$7.50 Verbatim account of the discussions held at MIT on the occasion of its Mid-Century Convocation March 31, April 1-2, 1949.

THE NEUROLOGIST'S POINT OF VIEW: Essays on Psychiatric and Other Subjects—I. S. Wechsler—*Wyn*, rev. ed., 261 p., \$3.00 A neurologist discusses many of the problems of mankind today.

PHYSICAL CHEMISTRY—Walter J. Moore—*Prentice-Hall*, 592 p., illus., \$6.65 An introductory college text.

THE RUBBER-BALL GAMES OF THE AMERICAS—Theodore Stern—*Augustin*, 122 p., illus., \$2.50 A monograph on the beginnings of the rubber ball games in the Western Hemisphere.

SECRET—Michael Armine—*Houghton Mifflin*, 311 p., \$3.00. The story of one man's adventures in helping to make the atomic age. Fiction, of course.

SOIL FERTILITY AND SEWAGE—J. P. J. Van Vuen—*Dover*, 236 p., illus., \$4.50 A report of the author's work in South Africa.

STERILIZATION IN NORTH CAROLINA: A Sociological and Psychological Study—Moya Woodside—*University of North Carolina Press*, 219 p., \$2.50 An account of one state's experiment in eugenic sterilization

SURVIV OF FOOD AND NUTRITION RESEARCH IN THE UNITED STATES 1948-1949—Food and Nutrition Board of the National Research Council—*U. S. Dept. of Commerce*, 311 p., paper, \$1.75.

TEXTBOOK OF ABNORMAL PSYCHOLOGY—Roy M. Dorcus and G. Wilson Shaffer—*Williams & Wilkins*, 4th ed., 717 p., illus., \$5.00. A college textbook brought up-to-date

THREE TO SIX. Your Child Starts to School—James L. Hymes, Jr.—*Public Affairs Committee*, 32 p., illus., paper, 20 cents A brief discussion of the many problems parents have in sending a child to school for the first time.

YOU CAN STOP DRINKING—Harold M. Sherman—*Creative Age Press*, 245 p., \$2.49. A few hints on how to control excessive drinking.

YOUNG AT ANY AGE—*New York State Joint Legislative Committee on Problems of the Aging*, 192 p., illus., paper, free upon request to Sen T. C. Desmond, 94 Broadway, Newburgh, N. Y. This report places particular emphasis on charting a blueprint for state action in dealing with our aging citizens.

Science News Letter, September 16, 1950

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⚙️ **WINDSHIELD PROTECTOR**, for use at drive-in movies, is a visor-like attachment to keep rain and snow off the windshield and promote good vision. It is a flexible plastic material, easily and quickly attached, that is held in place by a frame-work extending under the car's door

Science News Letter, September 16, 1950

⚙️ **COFFEE TABLES** with tops that resemble marble are made of a plastic known as melamine formaldehyde resin which will not chip, peel, or mar from cigarette burns or alcohol. They come in round, square or rectangular shapes, and a choice of colorings

Science News Letter, September 16, 1950

⚙️ **FLOOR FINISH** for gymnasiums, handball courts and other recreational rooms is a plastic product utilizing cellulose. Several coats are applied, the first of which penetrates the wood to make a perfect bond. The finish is transparent and does not change the color of the floor

Science News Letter, September 16, 1950

⚙️ **HAY FEVER ATOMIZER**, when squeezed, produces an extremely fine mist as shown in the picture. It is an antihistamine dispenser, made of polyethylene, which is used to shoot the hay fever drug anahist



into the nostrils and to the nasal membranes. A screw-on cap makes it safe against leakage in the handbag.

Science News Letter, September 16, 1950

⚙️ **TRAILER SWEEPER**, a three-wheeled affair to tow behind a car or truck to

clean streets and airport runways, is powered with a 15 horsepower engine and has revolving brushes from six to nine feet in length. It is built for one-man operation, and is sturdy enough for removing snow.

Science News Letter, September 16, 1950

⚙️ **TIRE ALARM**, attached to the tire like an ordinary valve cap, whistles a loud alarm when the pressure within the tire gets below the amount needed for safe driving. It adds another safety factor as well. Being luminous, it shows at night as a revolving circle of light.

Science News Letter, September 16, 1950

⚙️ **ELECTRIC BULB**, battery-operated and designed to replace the many thousands of oil lamps used at railroad switches, has inside frosting that diffuses light to lantern-flame size. A new-type non-rechargeable battery, developed to use with the bulb, operates 10 months continuously.

Science News Letter, September 16, 1950

⚙️ **COOLER** for liquids in a pitcher is a cylindrical watertight ice receptacle which stands upright in the liquid. The metal walls of the ice container in this recently patented device permit rapid cooling of the surrounding liquid.

Science News Letter, September 16, 1950

o Know?

The shot load from a gun, traveling at a rate of 950 miles an hour as it leaves the muzzle, slows to about a 650-mile rate at 20 yards.

The Lapps of northern Norway have a three-year-old organization in the interest of preserving and fostering the unique Lapp culture.

The use of soap per person in the United States was 15% less in 1949 than the previous year, but the use of synthetic detergents greatly increased.

Lampreys are eel-like primitive fish with well-developed sucking mouths; some are parasitic and attach themselves to fish and obtain nourishment from the body of their host.

Unleached wood ashes may contain from 5% to 7% potash and 1% to 2% phosphoric acid and therefore are a valuable fertilizer; ashes that have been leached by rain have much less value.

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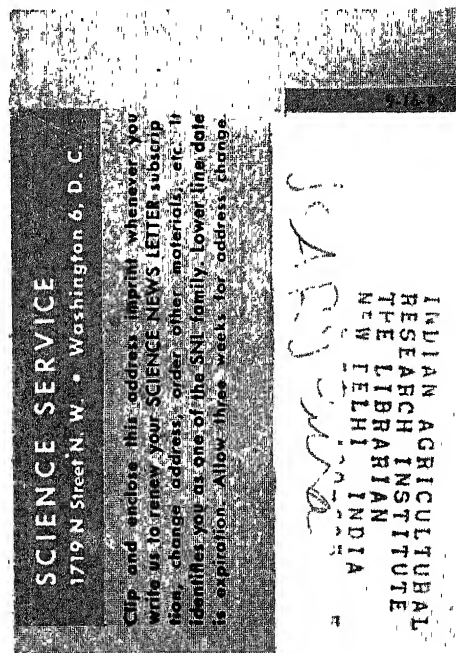
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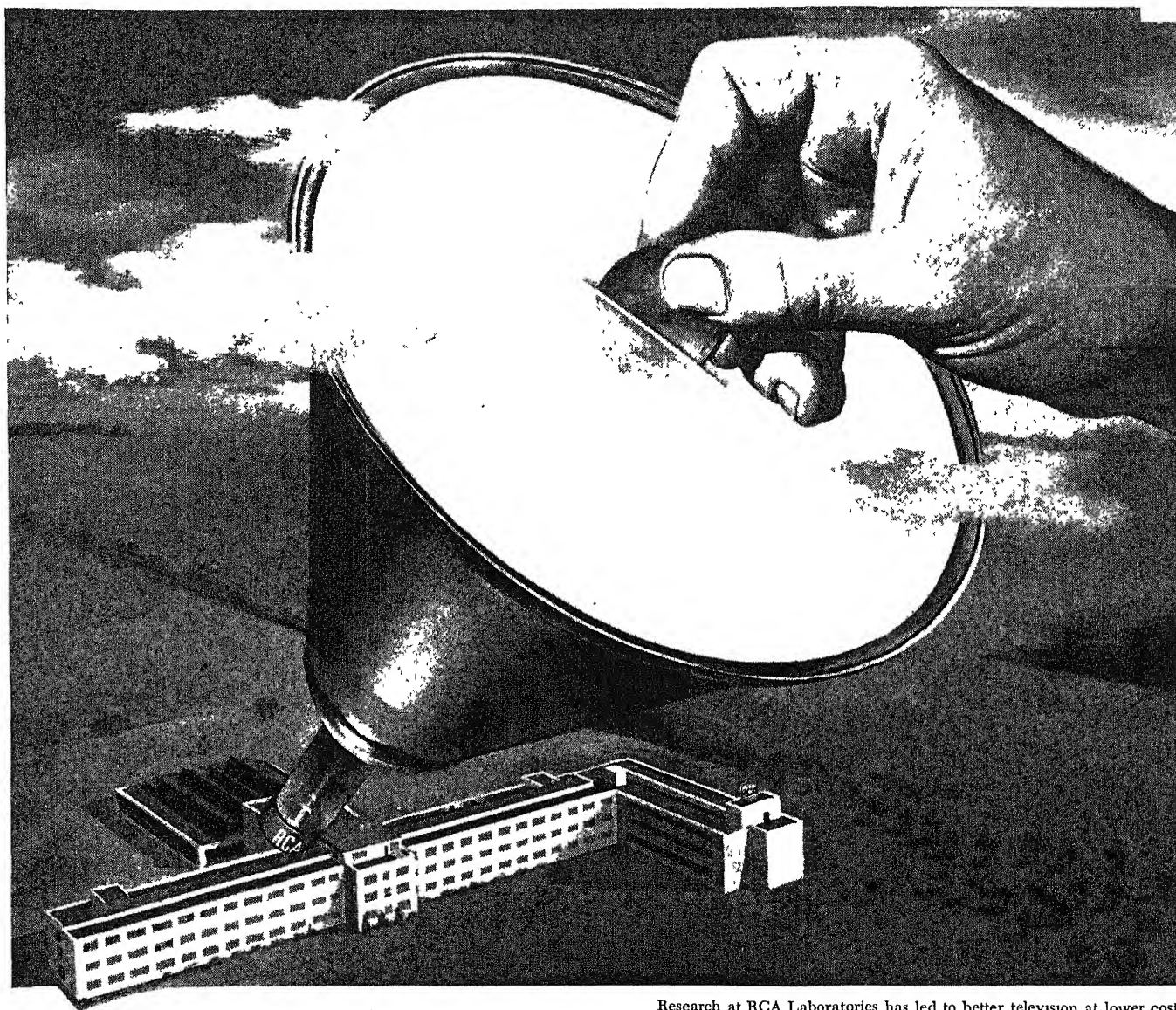
"Built-In" Bait

See Page 198

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CHEMISTRY

Tritium Found in Air

Although tritium, the world's rarest natural chemical element, has been found in the moisture of the air, it will not be extracted from air in securing material for H-bombs.

➤ MATERIAL for making hydrogen bombs will not be extracted from the air even though one of the H-bomb ingredients, tritium (triple-weight hydrogen) has been discovered in very small amounts in the moisture of the air.

It is found as one part of tritium in a million times a million times a million (1,000,000,000,000,000) parts of the water's hydrogen.

The real importance of the identification of this natural tritium made by cosmic rays is the fact that it is the world's rarest natural chemical element.

Recognition of naturally occurring tritium, announced by Dr. Aristid V. Grosse of Temple University's new Research Institute, as a result of his studies with Dr. W. F. Libby of the University of Chicago, climaxes a 15-year-old scientific dispute as to whether the short-lived isotope exists only when man-made. The team of atomic scientists find that it is constantly being made in nature by action of cosmic rays on the nitrogen of the air.

Discovered as the result of atomic bombardment by the British scientist, Lord Rutherford, tritium was believed to exist only as a man-made particle until 1935, when Dr. Hugh S. Taylor, of Princeton University, discovered indications of tritium in water concentrated electrolytically in his laboratory. Dr. Taylor and his associates were at the time studying the then newly discovered deuterium, the heavy hydrogen which is not radioactive. They based their claim to finding tritium on determination of the weight of the hydrogen in water from various parts of the United States. In this study they had found that water in the clouds crossing the Rocky Mountains is separated according to the weight of the isotopes of hydrogen which compose it.

Taking a sample of water containing tritium with him, Dr. Taylor in 1935 went to London to visit Lord Rutherford, and was roundly denounced by the scientific leader for claiming an impossibility. Rutherford then gave Dr. Taylor one cubic centimeter of concentrated water and challenged him to find tritium in it. Today's techniques, with much greater accuracy in measuring radioactive strength, have proved that the sample to which Rutherford pinned his faith was giving off radioactive disintegration products of tritium all the while.

Besides the sample from Rutherford's laboratory, sent to Dr. Grosse and Dr. Libby for analysis by Dr. Taylor, other samples of water concentrated by electro-

lytic action have been analyzed by the research team. One sample was furnished by the Norsk hydroelectric plant, for which Norway has received scientific thanks. This sample came from the surface waters of the ocean. Its tritium content is to be compared with other samples from equatorial regions and from the depths of the sea. Cosmic rays, which are believed to be the source of tritium in nature, are more plentiful in the northern regions of the earth, and have more effect near the surface than at great depths in the ocean. Turbulence of the ocean waves mixes the surface waters, but is believed not to disturb layers of water below about 300 feet.

There should be more tritium at the north pole than at the equator because there is more cosmic ray bombardment in the northern latitudes due to the focusing of the cosmic radiation by the magnetic field of the earth.

There should be more tritium, just as there is more deuterium (double-weight hydrogen), in the water of rain on one side of the Rocky Mountains than the other side to which the storm travels.

There is little practical use of naturally

occurring tritium just now. The extremely accurate methods of detection of its radioactivity would hardly be useful for childish snooping to see who is making tritium for bombs behind our backs.

Three years ago Drs. Grosse and Libby discovered that cosmic rays produce radioactive carbon 14 in living matter. This has provided a reliable radioactive method for determining the age of archaeological samples.

Science News Letter, September 23, 1950

MEDICINE

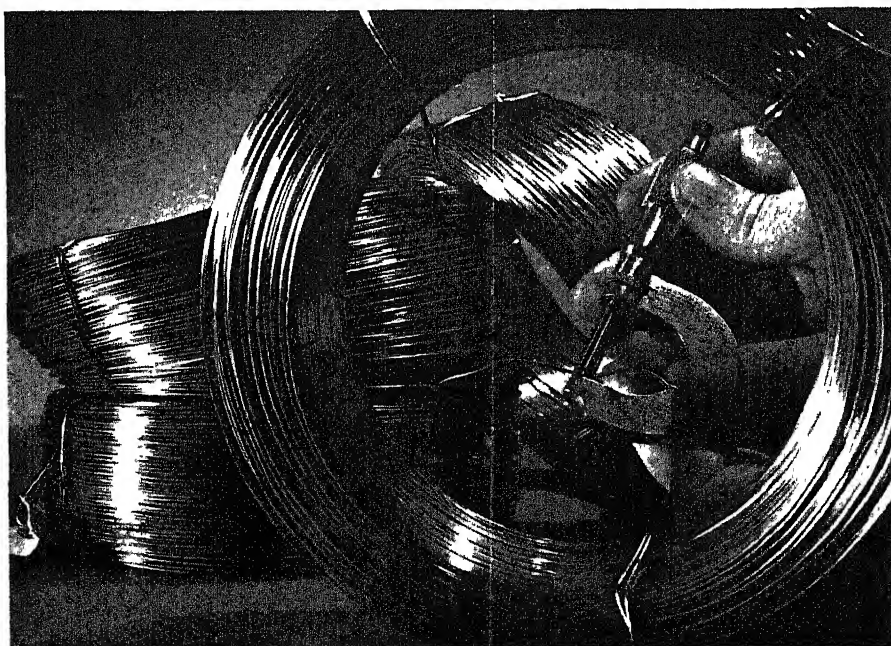
Federal Funds to Aid Attack on Artery Disease

➤ THE ATTACK, via fat, on one kind of artery disease which causes many heart deaths will be intensified with a war fund totaling \$230,773 just granted by the U.S. National Heart Institute to four non-federal research institutions.

The artery disease is known as atherosclerosis. Its consequences are responsible for 40% of the 750,000 heart and artery disease deaths each year in the United States. It can affect younger as well as older persons.

Fat molecules in the blood have been implicated as the cause of this artery disease. Further research on this point will be pursued under the grants made to the University of California, Harvard School of Public Health, Cleveland Clinic and the University of Pittsburgh.

Science News Letter, September 23, 1950



"FINAL INSPECTION"—The above photograph by Robert A. Buchanan, United States Steel Research Laboratory, won first prize in the General Section, Black and White Prints, in the Seventh American Society Testing Materials Photographic Exhibit.

MEDICINE

Drug Stops Polio Pain

➤ USE of a drug instead of moist hot packs to relieve pain, muscle spasm and circulatory trouble in poliomyelitis is reported by Dr. Emil Smith and associates of the Kingston Avenue Hospital, Brooklyn, N. Y., in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Sept. 16) in Chicago, Ill.

The drug is known by the trade name of prisolone. Heretofore it has been used for disorders of circulation and high blood pressure.

Polio patients, the Brooklyn group reports, began to improve within 30 minutes after getting the drug by mouth and even faster when it was given by injections into the muscles. When the dose was big enough to produce a good effect, the "patients experienced a sense of well-being and sighed with relief," the doctors state.

"The pain either diminished or disappeared entirely. In most cases muscle tightness diminished and they were able to move the non-paralyzed parts more freely. They rested more comfortably during the day. Their appetite improved and they enjoyed their food. The majority stated that they were able to sleep comfortably for the first time since the illness began. Muscle twitchings present in some of the patients receded. Cold and clammy skins became warm, and excessive sweating disappeared."

The drug was given to 663 patients during the year 1949. It does not stop the spread of the polio virus through the central nervous system or alter its effects on nerve cells or prevent paralysis. It is not presented as a cure but as an aid in shortening the period of muscle spasm and pain so that rehabilitation treatment can be started as early as possible.

Unpleasant effects were nausea and vomiting, heart palpitation, chills, diarrhea and in five patients a feeling of things crawling

on their skin.

The Brooklyn doctors tried to avoid giving the drug to patients with encephalitic, bulbar and bulbospinal polio and to those in iron lungs.

Associated with Dr. Smith in this study were Drs. David J. Graubard, Joseph Falcone, Thurman B. Givan, Philip Rosenblatt and Mr. Avner Feldman.

Science News Letter, September 23, 1950

VETERINARY MEDICINE

Tender Steaks Now May Mean No Steaks in Future

➤ TO satisfy the appetites of sirloin steak buyers, U. S. ranchers may be progressively fattening their cows to the point where they cannot have calves, the American Veterinary Medical Association was told in Miami Beach, Fla.

Dr. G. T. Easley of Sulphur, Okla., warned that long years of selective breeding with an eye toward plumpness of beef cattle can produce cows apparently normal in every respect, yet unable to conceive and bear.

To produce tender steaks, ranchers in effect have been breeding cows with slowed-down thyroid glands. This condition, said Dr. Easley, obstructs normal functioning of the reproductive system. Excessive fat may hinder blood circulation, lower resistance to infection and impair the fertility of a cow.

Treatment with thyroid preparations and ordinary reducing diets may both show startling results in calving performance, he said.

Another cause for trouble in breeding was suggested to the annual veterinarians' conference earlier by Dr. A. H. Frank of the U. S. Department of Agriculture's National Disease Center at Beltsville, Md.

More than half the cows in a group of 2,000 Maryland cattle have impaired breeding performance, he reported. A study of commercial dairy and beef herds showed 25% of the females, although free from recognizable infection, failed to conceive when bred. Another 25% failed to come into heat having once calved.

Neither mechanical stimulation of the reproductive organs nor treatment with pregnant mares' serum was effective, on the whole, Dr. Frank reported.

Science News Letter, September 23, 1950

SCIENCE NEWS LETTER

VOL. 58 SEPTEMBER 23, 1950 No. 13

44,300 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W. Washington 6, D. C., NORTH 2255 Edited by WATSON DAVIS

Subscription rates 1 yr., \$5.50; 2 yrs., \$10.00, 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address. Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925, 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago STAtE 4439

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What animal eats the caterpillar "from the inside out"? p. 206.

PSYCHOLOGY

Propaganda Offensive

We need to let the whole world know that we do not want war. Delegates to international conferences should be screened for mental adjustment.

➤ MAJOR task for the United States in the present world crisis is to reduce the fear that Russia has of the United States, Prof. Otto Klineberg, of Columbia University, told his colleagues in State College, Pa., at the meeting of the American Psychological Association.

"We cannot disarm," he said. "That would be too dangerous at this juncture. We can, however, embark upon a powerful propaganda or informational offensive, designed to make clear to the whole world, including the Soviet Union, that we want peace and not war; that we will never start a war, not even a preventive war."

Psychologists know that aggression may be born of fear. The violent "running amok" which afflicts some Indonesian natives was found to be due to the conviction on the part of the sufferer that he is about to be attacked by others. He slashes about in fury to protect himself from his imaginary enemies. In a similar manner, one of the factors of Soviet aggression against us may be fear of us.

Psychologists also know that a person's way of viewing an action, or even an object, is influenced by his nationality and other group affiliations.

U S diplomatic and military actions should be planned with this fact in mind, Prof. Klineberg suggested. American aid to Greece and Turkey, for example, is seen differently by ourselves and the Soviet leaders. What looks right to us as a legitimate means of aiding these countries to remain free, looks to the Russians like a threat to themselves.

Delegates to international conferences should be screened for mental adjustment, Prof. Klineberg suggested.

"Not a few international conferences have been wrecked," he said, "by the presence of one or more participants who were insecure, oversensitive, suspicious or resentful, to a degree which indicated that they were not psychologically healthy individuals."

Before a man is allowed to attain a position of national leadership, he should be certified as "normal" by a panel of experts from an independent organization such as the World Health Organization, the World Federation for Mental Health or an International Association of Psychologists, Prof. Klineberg proposed. We make candidates for the police force pass tests of physical and mental capacity, why not national leaders? If such a test had been in

use, Hitler, Goering, Himmler, Hess, and Streicher could not have reached power, he stated.

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CHEMISTRY

Outdoor Chemical Plants Provide Greater Safety

➤ OUTDOOR plants for manufacturing chemicals, particularly where explosion and poisoning hazards may exist, have many advantages, the American Institute of Chemical Engineers was told in Minneapolis, Minn. Now quite general in oil refineries, they are suitable for other industries.

Unhoused chemical plants can advantageously be installed in Canada and Michigan, with their long winters, as well as in warmer country, the engineers were told by William H. Williams, Dow Chemical Company, Midland, Mich.

The out-of-doors plant has many advantages, he said, of which reduction in operating hazard and maintenance costs is probably the most important.

Perhaps the principal cause of disaster in the operation of an organic chemical plant, handling materials that are flammable but not explosive in nature, is explosion caused by the confinement of vapors in a restricted space.

This is the opinion of Homer Kieweg, Commercial Solvents Corporation, Terre Haute, Ind. Concentrations of vapors in the explosive ranges are likely to occur due to some failure of equipment or operation, he said. Prevention of explosive mixtures in confined spaces under these conditions is oftentimes impossible. With outdoor plants this danger is eliminated.

The former general custom of housing chemical plants in totally enclosed-type structures is gradually being reversed in the direction of outdoor-type installations, the meeting was told by representatives of the E. B. Badger & Sons Company, Boston. Petroleum refineries were cited as examples.

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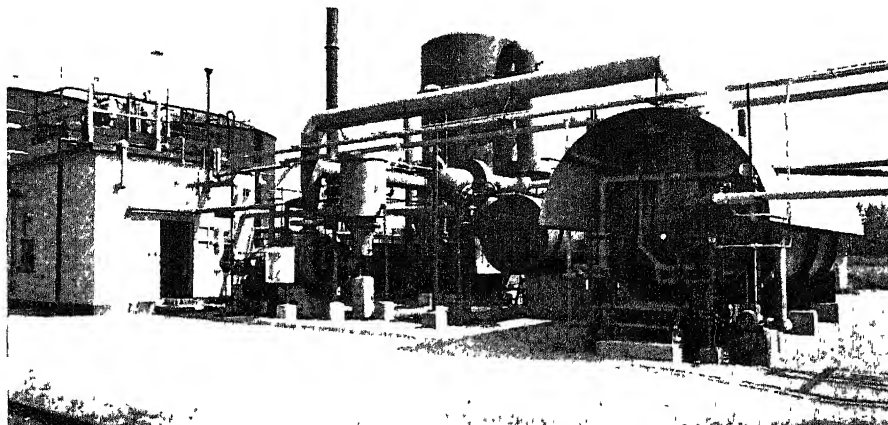
BOTANY

Naphtha Spray Kills Evergreen Nursery Weeds

➤ A FINE spray of mineral spirits or naphtha can take the weeds out of evergreen nurseries at a cost of only a tenth that of the usual laborious hand weeding, J. H. Stoeckeler, forester in charge of the Northern Lakes Forest Research Center, Rhinelander, Wis., reported to the American Chemical Society in Chicago, Ill.

Such sprays applied at relatively high pressure are effective on seedbeds of pine, fir, juniper and spruce, but broadleaf species such as elm, oak and maple are killed by the naphtha.

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OPEN AIR CHEMISTRY—An American Cyanamid Company commercial-size plant in Hamilton, Ohio, for the production of sulfuric acid is an example of chemistry in the open. Operating hazards and maintenance costs are cut to a minimum in this type of plant.

ASTRONOMY

Eclipse of Moon

A total eclipse of the moon will occur on Sept. 25 and 26. This will be the last total eclipse until the first part of 1953.

► THE BIG celestial show for this month is the total eclipse of the "harvest" moon on the night of Sept. 25 and 26. Only a last minute veto of the weatherman will cause cancellation of the performance as viewed from the earth.

The show will be visible during the late evening hours throughout the United States and most of the Western hemisphere. The entire performance will last five hours, 53.5 minutes, although the moon is totally eclipsed only 46 minutes.

Lunar eclipses occur when the moon, as it revolves around the earth, passes into the great conical shadow cast by the earth in space. By putting a bright light on a table in the middle of an otherwise dark room, then walking around the table and watching the wall, you can get an idea of how the shadow of the earth sweeps across space.

There are two parts to the earth's shadow, as there are to every shadow cast by an object where the light source has an appreciable size. The inner core is called the umbra and is the true shadow. Around this there is a region of partial shadow known as the penumbra.

The edge of the moon first enters the

penumbra at 8:20 p.m. E.S.T., but so little sunlight is cut off that it will take until about the time the moon enters the umbra to notice a change in its brightness. This will be at 9:31.5 p.m. E.S.T.

The total phase of the eclipse begins at 10:54 p.m. E.S.T. Before totality begins, the earth's shadow on the moon will have appeared gray, then black. However, as totality commences, the moon takes on a coppery-red glow. Although the earth completely eliminates the direct solar rays, some of them are bent by prismatic action of the earth's atmosphere thus giving the moon its coppery-red color, since red predominates in the light thus bent. This same effect is observed in the sunset's red color.

Totality is over at 11:40 p.m. E.S.T. The moon leaves the umbra at 1:02 a.m. E.S.T. on Sept. 26, and the whole performance will be over and the moon again shining with undimmed brilliance at 2:14 a.m. E.S.T.

This will be the last total eclipse of the moon visible from the United States until Jan. 29, 1953. There will, however, be a partial eclipse on Feb. 10, 1952.

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ASTRONOMY

"Shooting" the Eclipse

► YOU can take a picture of the eclipse of the moon on Sept. 25 with your own camera in your own backyard, weather permitting.

Your camera must be one which can be focused for infinity, and you must have a good, solid support for it. This support need not be a tripod—a chair or a fence-post with a chunk of wood or a solid book to give the correct angle to the camera will serve.

Your picture of the moon in eclipse will probably come out better if you keep the lens open all the time, shielding it with a piece of black cardboard when the film is not being exposed. In this way, you will not jar the camera, thus spoiling your picture.

The kind of film you use and your lens opening will affect the exposure time necessary for a good shot. To be absolutely certain that you have the right settings, it would be a good idea for you to take some trial pictures of the moon a day or two before the eclipse is scheduled. Then the moon will be about the same brilliance as on the night of the big performance.

Test various exposure times with different lens openings, varying only one of these at a time and keeping a record of the settings used for each picture. A lens opening of $f/8$ and an exposure time of one second could be used for the first trial photograph. If you do not have time to make test runs, for the eclipse itself try a one-second exposure for a lens opening of $f/32$, or one-fourth of a second for lens opening $f/16$ or one-twenty-fifth of a second for $f/8$. A box camera would take about a fifth of a second exposure.

Set the distance for infinity and use high speed panchromatic film for best results. Avoid taking pictures during the times the sky is cloudy.

Because exposures are made in the dark, it is best to test the steps necessary to get a complete record of the moon's eclipse before you actually start to take the pictures. Be sure that no light other than that from the moon shines into the lens of your camera.

Just before the moon begins to enter the full shadow (9:31.5 p.m. E.S.T.), adjust your camera so that it is aimed for the center

of the path which the moon will follow across the sky. This would mean about 15 degrees west of the moon's position when you begin. If you adjust your finder so that the moon is in the lower left hand corner, it will be correctly aimed and the moon should then be in the lower left part of your negative when it enters the first visible stage of the eclipse.

Take your first picture when the edge of the moon first disappears and another picture every ten minutes after that until eight pictures are taken. Then the eclipse will be total.

At that time, if you wish to take pot luck with a roll of film, you can try to see what pictures you can turn out of the moon in full eclipse. Test an exposure time of four or five seconds. It might also be possible to record some of the coppery color on color film, using a very wide lens opening.

When the moon emerges from totality at 11:40 p.m., you can record the second half of the eclipse by taking a picture every ten minutes for the hour and 12 minutes until the moon passes out of the earth's deep shadow or umbra. This should be done with a new film and your camera should again be aimed at the middle of the expected path.

Either for the series of pictures of the earth's shadow covering up the moon or for the pictures of totality, if you attempt those, it is not necessary to move your camera. The rotation of the earth will space the images on your film properly. The moon moves its own distance in approximately two minutes.

Your pictures of the eclipsed moon will be more satisfactory if the focal length of your camera is at least 10 inches. Whatever the focal length of your camera, the photograph that you take of the moon will reduce its image to approximately one-hundredth of that focal length, so the moon in your picture may be quite small.

Science News Letter, September 23, 1950

On This Week's Cover

► THE Reddish Frogfish is one of those odd creatures that is equipped with a "built-in" fishing apparatus. The fish has a very large mouth above the center of which projects a long whip-like ray. A small tag of flesh known as a lure is attached to the end of the ray. When the fish becomes hungry and a suitable fish is near, the lure is tossed to and fro, and as the rod is almost invisible, the bait looks like some tiny creature. The attracted fish tries to catch it whereupon the wiley frogfish gives him a merry chase which leads directly into the mouth of the frogfish. Net result: A sad ending for the attracted fish but a succulent meal for the frogfish.

Science News Letter, September 23, 1950

GENETICS

The mutation rate for certain genetic factors in corn has been increased. Artificial mutation is thought to be different from natural mutation and is now being avoided.

➤ THE EVOLUTIONARY changes blasted into living things by X-rays and A-bomb radiations are not the same as those caused by the changes in germ plasma—mutations the scientists call them—that occur naturally.

But there is hope that these extremely slow and rare changes in the hereditary stock of all living things that occur in nature can be speeded up by the same process of selective breeding that has produced superior plants and animals for our modern agriculture.

An outstanding new development reported at the golden jubilee meeting of the Genetics Society of America, celebrating the first 50 years of genetics, was the acceleration of natural mutation reported by Dr. L. J. Stadler of the University of Missouri.

Working with a special kind of corn, the heredity of which has been studied for years, Dr. Stadler has been able by cross-breeding to obtain about a hundred times the normal mutations of a few of its thousands of genes, or carriers of heredity.

So complex are these extremely minute portions of cells, which carry on life from generation to generation, that biologists

must work with very special sorts in order to discover the laws of inheritance that are generally applicable.

Changes in these genes are believed to be the mechanism of evolution itself. A quarter century ago it was discovered that X-rays and even ultraviolet light, acting like submicroscopic machine gun bullets, could damage genes and produce changes in heredity that could be carried on into later generations. Hailed at first as a means of producing the equivalent of natural evolution, geneticists are now fearful that artificial mutations use another mechanism and they are turning again to natural mutations for their studies.

Dr. Stadler's success in increasing the mutation rate for genes controlling color of corn seed and plants gives new hope to this line of research, which is still tedious and time-consuming. He has shown that a tendency to change is inheritable, as it were.

The new findings do not lessen the danger of radiations to human, other animal and plant populations, for severe doses of X and other radiations are still dangerous to future generations, possibly producing monstrosities for the future.

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mycin, a new member of the modern family of wonder drugs.

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INVENTION

No Flame or Electric Arc In Cold Pressure Welding

➤ WELDING such metals as aluminum and copper without the use of hot flames or electric arcs is possible with a cold pressure process on which the government issued a patent recently. It can be used with many non-ferrous metals.

Patent 2,522,408 was issued to Anthony Bagnold Sowter, Wembley, England, for this process. Rights have been assigned to General Electric Company, Limited, London.

As described by the inventor, the process involves bringing the metals to be welded into contact with each other. Then by the application of pressure, the metals are caused to flow away from the welding point and into interleaved relation with the grains of the metals being welded.

Before welding, oxide films and other impurities on the metals are removed. In aluminum welding a pressure of from 12 to 18 tons per square inch is used. With copper, two to four times this pressure is required.

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MILDEW CONTROL—The canvas bucket and webbing at the left have been protected against mold decay by one of the Cunilates developed for the Air Force. Victor N. Kalberg, who developed solubilizing technique, compares them with similar items which almost completely disintegrated after 28-day soil burial test. The Cunilates are available in permanent and non-toxic solutions and emulsion.

BIOLOGY

Fungus Rot GI Headache

➤ FUNGUS rot, the work of tiny micro-organisms which attack even plastics is becoming a major headache to U. S. armed forces.

In a two-day symposium at the American Institute of Biological Sciences meeting at Ohio State University, scientists described the type of decay reported to have brought failure in Korea of communications equipment stored since World War II on tropical Pacific islands.

Electrical power drives for gun mounts, electronic hook-up wire and similar equipment can deteriorate fast from fungus attack, even in parts of the world where high humidity is not a serious problem, Dr. Walter N. Ezekiel of the Navy's Bureau of Ordnance said.

Certain types of fungus and bacteria, said Dr. James V. Harvey of the Philadelphia Quartermaster Depot's biological laboratories, will destroy flexibility in plastic films used to insulate such equipment.

Such attack is complicated. Fungus

grows in mold. Bacteria come along, and because of antibiotic activity, attack the fungus. Then the bacteria in turn attack the plasticizing agent in the insulation.

At Rensselaer Polytechnic Institute, researchers working under armed forces contract found that insulation began to break down under fungus rot within 12 hours of exposure to high humidity and temperatures, Dr. Mary P. Gauvey reported. The attack can come from the inside out, she said. Insulation resistance began to drop before outside mold became visible.

The fungi are extremely hard to stop. Various anti-fungus chemicals have been incorporated into the plastics, Dr. Harvey said, but without much effect. A coating that is poisonous will not stay poisonous, a team of scientists from Battelle Memorial Institute in Columbus reported.

From Notre Dame scientists came one possibility. Fungus was reported by Drs. J. A. Jump and K. S. Gopalkrishnan to be killed by an antibiotic cousin of strepto-

MILITARY SCIENCE

Korean War Tougher Than World War II

➤ THE Korean war is tougher than World War II. Men who went through Normandy, Anzio and Pacific battles without breaking but who are casualties of the present fighting told this emphatically to Dr. Karl Bowman, University of California Medical School psychiatrist.

Dr. Bowman, who has just returned from Japan, saw the men in hospitals that he visited for the Surgeon General of the Army.

Patterns of psychiatric cases among American veterans in the Korean war are following those of World War II, Dr. Bowman found. Mostly there are cases of combat fatigue, with few cases of conversion hysteria.

Dr. Bowman said that while figures are not available, one would expect a larger percentage of psychiatric casualties from the earlier stages of battle for following reasons: the soldiers were not adequately trained, seasoned, equipped; the fight was a losing one and seemingly hopeless for men on the ground; the North Koreans were better trained and equipped than anticipated.

The nature of the fighting does not yet permit psychiatric clearing posts near the front line for quick treatment, as in World War II. Casualties are now evacuated to Japan. Dr. Bowman says the Army is doing an excellent job in evacuating and treating patients. During his short stay, one hospital returned 70% of casualties to combat and anticipated the return of a large per cent of the remainder to non-combat duty.

Dr. Bowman says that as the United States moves to the offensive, fewer psychiatric casualties can be expected.

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BOTANY

Poinsettias Blossom Just In Time for Christmas

➤ THREE government scientists gave the nation's flower-lovers a Christmas present—a way to nudge poinsettias into putting forth their bright red leaves just in time for the holiday season. The secret: keep them in the dark for at least 13 hours a day.

Drs. M. W. Parker, H. A. Borthwick and Laura E. Rappleye of the Agriculture Department's Bureau of Plant Industry described their experiments with poinsettias before the American Society for Horticultural Science in Columbus, Ohio. Blooming of the Christmas plant can be either slowed or speeded up, they said, by varying the ratio of daytime to darkness. This response of plants to different day lengths is known as photoperiodism.

Poinsettias need short days, the research-

ers said. If cuttings are started between Oct 1 and 10 and kept in total darkness 14 to 16 hours a day, the flowers and scarlet leaves will bloom without fail for Christmas, they said. Less than 13 hours of darkness will slow the blooming greatly. It can be hastened by extending the dark period to 16 hours. But if the dark periods are broken too often, the plant will fail to bloom at all.

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ENGINEERING

Carbon Dioxide Generator Mobile, Has High Capacity

➤ A MOBILE carbon dioxide generator will produce the fire-fighting gas needed in large quantities for military uses.

The generator has a production capacity of 300 pounds per hour. It can operate at temperature extremes from minus 40 to plus 130 degrees Fahrenheit and is only about half the size of commercial plants of the same capacity.

The first of these units is now undergoing technical tests at the Army Engineer Research and Development Laboratories at Ft. Belvoir, Va. A second will be delivered soon. The gross weight of the mobile generator is 43,000 pounds. It is mounted on pneumatic dual tires for easy moving.

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MEDICINE

Streptomycin, Tuberculin, Effect "Miraculous" Cure

➤ THE "almost miraculous recovery" of a two-year-old boy, paralyzed and blinded by tuberculous meningitis "for whom all hope of recovery had been abandoned," has been achieved by a combination of one of the new wonder drugs, streptomycin, and an old, abandoned TB remedy, tuberculin.

Details of this treatment, and a warning on how to avoid its dangers, are reported by Drs. Hugh Cairns, Honor V. Smith and R. L. Vollum, of Oxford, England, in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Sept. 9) in Chicago.

The child's sight returned and within less than a year he was "a fat, active, healthy-looking little boy with a head of normal size, a growing vocabulary and what appeared to be normal intelligence."

Equally good results in a second case have encouraged the English doctors to start this treatment in seven others. It is too early to know what the results will be in these.

The reason the combined treatment was effective seems to be that the streptomycin takes care of the germs while the tuberculin does just what its discoverer in 1890, Robert Koch, claimed it would when he said: "The remedy does not kill the tubercle bacilli but the tuberculous tissue."

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PLANT PATHOLOGY

Lack of Minerals May Cause Sick Timothy Grass

➤ SICK timothy grass may be suffering from a deficiency of minute amounts of certain minerals, Dr. R. D. Williams, British plant physiologist, told the British Association for the Advancement of Science meeting in Birmingham, England.

Iron, copper, manganese and zinc are all needed in one or less parts per million for healthy growth, he stated. When timothy is deficient in iron, manganese and zinc, the plant is wan and weak. Copper-deficient timothy is flushed an unhealthy darker green.

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MEDICINE

Coconut Oil Is Quick Energy Source

➤ INJECTING specially prepared coconut oil into the blood stream can put fat on underweight normal persons and supply energy to many hospital patients unable to eat all the food they need, Dr. Robert P. Geyer of Harvard School of Public Health told scientists at a University of Rochester Medical School symposium in Rochester, N. Y.

The symposium was on lipids, which is a collective name for dietary fat and its various forms. It was held in honor of Dr. Walter R. Bloor, emeritus professor of biochemistry at the University of Rochester Medical School, whose work in this field has made him internationally known as "the dean of fat metabolism."

The coconut oil vein feeding solution is prepared by passing a mixture of purified coconut oil, sugar solution and emulsifying agents through a machine similar to those used for making homogenized milk. The particles of fat in the resulting emulsion are smaller than bacteria.

Patients with stomach ulcers, certain kinds of cancers and kidney diseases and other patients before and after operations are among those who have been helped by these coconut oil feedings. Because the fat gets directly into the blood stream, difficulties such as lack of appetite, inability to swallow food or to absorb it from the intestine are overcome.

Emulsions containing radioactive fats have been given laboratory animals and traced through the animal's bodies. The fat, these studies showed, was rapidly used by the body for energy. Fat-soluble vitamins can be incorporated in the emulsion when needed.

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THE FIELDS

WILDLIFE

Look at Teeth to Tell Age of Fur Seals

► THE AGE of a fur seal can be told from its teeth, with ridges or growth layers around the tooth roots corresponding to the years it has lived.

Because Uncle Sam protects the Alaskan fur seal and his biologists have marked 80,000 young seals with hot-iron brands or numbered metal tags in recent years when the herds come to the Pribilof islands in Bering Sea each summer, Dr. Victor B. Scheffer of the U. S. Fish and Wildlife Service has been able to puzzle out the meaning of the growth ridges in their teeth.

Tooth growth is greatest when the seals are widely spread at sea during winter and spring, but virtually stops in the summer and fall when the animals are at their Pribilof breeding grounds. Males abstain from food and drink during this time, living off their fat, while females nurse their young for four months at the expense of their own growth. This growth cycle is reflected in the teeth, and the layers accurately represent the age of the seal up to four years and occasionally up to seven or eight years.

Biologists have previously been able to estimate the age of fishes by growth lines on scales and some bones. But the rapid growth of fish corresponds to the warmer months of the year, not the colder months as with seals, since fish adopt the temperature of the water in which they live, unlike seals which are mammals.

Dr. Scheffer reported his research to the journal, *SCIENCE* (Sept. 15).

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WILDLIFE

Trumpeter Swans Prefer Canada, Alaska to U. S.

► THE U. S. is losing its trumpeter swans, even though the overall North American population of this rare and beautiful bird seems to be booming back from the edge of extinction.

The truth of the matter is, U. S. Fish and Wildlife Service officials report ruefully, the trumpeters seem to be moving to Canada and Alaska.

Only 376 trumpeters showed up this year for the annual swan census at Yellowstone Park and Red Rock Lakes wildlife refuges in Montana. Last year there were 451.

But, say Wildlife Service biologists, more and more trumpeters are reported in Brit-

ish Columbia and southern Alaska. They think the giant birds are moving back to ancient breeding grounds farther north.

Long ago the trumpeters flew in great numbers over all the American Midwest and West, from Missouri to California. But civilization moved in. By 1935, only 73 birds remained in this country. In that year, Red Rock Lakes refuge was established, and the trumpeters got protection by rigid laws.

It is hard to estimate how many birds there are now, one official said. In this country, there may be trumpeters breeding in the few wilderness regions left. As many as 350 have been seen in a single season in Alaska. And in 1948, the Canadian Department of Mines and Resources reported an estimated population of 900 trumpeters in Canada.

Science News Letter, September 23, 1950

EDUCATION

"Pay Attention" Method Discourages New Ideas

► THE teacher who scolds her pupils for being "inattentive," may be maintaining discipline, but she is not preparing a fertile soil for the growth of new ideas.

Actually, there are times when being inattentive is an advantage in preparing the conditions for creative thought, Dr. Edith A. Weisskopf, of Purdue University, told the meeting of the American Psychological Association meeting in State College, Pa.

It is one of the main aims of education, Dr. Weisskopf explained, to encourage the development of creative abilities. Yet it is rare for educators to encourage their pupils to use techniques which are thought to create a fertile soil for the growth of new ideas.

"Among the four stages of the creative process, namely, preparation, incubation, illumination, and verification," said Dr. Weisskopf, "we prepare young people for the first and last stage only."

One reason for the neglect of incubation and illumination, she feels, may be the fact that these two stages appear to be directed more by unconscious forces.

Gifted children can and do master the academic subjects in the elementary and in the secondary school in half the time allotted to these subjects, Dr. Paul Witty, of Northwestern University, a specialist on the education of geniuses, told the same meeting.

Their school work is less satisfactory and challenging to gifted children than to others throughout their high school years, Dr. Witty has found. Speeding them through their grades is the most frequent provision made for talented children, and this usually occurs in the elementary grades. Enrichment of the curriculum takes second place.

Science News Letter, September 23, 1950

BIOLOGY

Protoplasm Seen in Third Dimension for First Time

► THE INTERNAL arrangement of living cells can now be seen, showing life's fundamental protoplasm in three dimensions for the first time. This has been achieved through a new method of drying specimens viewed with the University of Pennsylvania electron microscope.

Dr. Thomas F. Anderson, biophysicist of Pennsylvania's school of medicine, told the International Congress on Electron Microscopy in Paris how a substitution of carbon dioxide under high pressure for the water in biological specimens leaves them unflattened showing details in relief previously unachieved.

The new drying technique can be applied to bacteria, viruses and other materials, opening the way to studying normal and diseased tissues and materials more effectively.

The University of Pennsylvania investigators replaced the water of the materials with a liquid, such as carbon dioxide under high pressure, whose surface tension is very low at ordinary temperatures. Raising the temperature causes the liquid to become a gas which escapes and leaves the delicate portions of the biological specimens uncollapsed. Ordinary drying or freezing and drying flattens the structure of the specimens due to the pull of the surface tension of the water.

Science News Letter, September 23, 1950

STATISTICS

Accidents Fifth Ranking Killer of Women and Girls

► ACCIDENTS kill more women and girls each year than any other cause except cancer and diseases of the heart, blood vessels and kidneys.

Falls account for almost half of the approximately 30,000 accidental deaths of females each year. Most of these, seven out of eight among white women, occur at ages of 65 and over when failing vision and hearing, weakened skeletal muscles and other physical deterioration of age make the person more prone to fall.

Under age 65, motor vehicles are the big cause of death among girls and women, and even in the advanced ages rank second only to falls, Metropolitan Life Insurance Company statisticians in New York report.

Burns and scalds are another important cause of female deaths. Among pre-school girls, scalds caused by falling into or upsetting hot liquids play a large role. At the school ages, burns from playing with matches and clothing catching fire from open flames are the major menaces. After childhood, deaths from burns and scalds reflect the special hazards to which housewives are exposed in kitchen and laundry.

Science News Letter, September 23, 1950

ASTRONOMY

Pegasus High in South

The Winged Horse constellation is prominent on October evenings. The horse which is inverted can be located easily by first finding the "Great Square."

By JAMES STOKLEY

► **HIGH** in the southern sky on October evenings can be seen a group of stars that form the well-known constellation of Pegasus, the winged horse. Although the stars are not extremely bright, their arrangement makes them easy to locate, serving as a useful guide for the location of other constellations.

It is a good idea to look first for the four stars that outline the "Great Square." This is shown on one of the accompanying maps, depicting the southern skies, as seen from a latitude approximately 40 degrees north. These maps were drawn to give the appearance of the skies at about 10:00 p. m., your own kind of standard time, at the first of October.

At any particular hour the stars and constellations seem to slip around the sky from east to west from one night to the next. Thus in the course of the year many different parts of the celestial sphere come into our view. For this reason, the arrangement shown is seen at about 9:00 p. m. in the middle of the month and about 8:00 p. m. at the beginning of November.

Outline of Pegasus

Actually, only three of the stars that mark the corners of the square are in Pegasus. Alpheratz, the one at the upper left, is in the neighboring constellation of Andromeda. The star in the opposite corner, Markab, is in the shoulder of the horse. The angular line of stars extending to the southwest from Markab is supposed to form the neck and head, for the horse is shown inverted! Enif marks his nose. The assemblage of stars going to the right from Scheat in the upper right corner forms the forelegs. The animal's hind quarters are not shown on the old star maps which used to show the imaginary figures about the stars. Algenib, the star in the lower left corner of the square, is in the wing.

Just below and also to the left of the square, are the stars marking Pisces, the fishes. Below the stars of the head of Pegasus we can see the figure of Aquarius, the water-carrier, where the only planet now easily visible is located. The planet is Jupiter, which is in the southeast at sunset and which remains conspicuous until early morning hours.

Vega in Lyra, the lyre, the brightest star visible these evenings, is seen high in the west. Directly above it is Cygnus, the swan, which contains the first magnitude star

Deneb. The two top stars of the square of Pegasus, followed to the right, serve as pointers to the swan. To the left of Lyra is Aquila, the eagle, with another bright star, Altair.

Low in the south we can see Fomalhaut in Piscis Austrinus, the southern fish, another star of the first magnitude, though its lowness causes a diminution in the apparent brightness. This also is true of Aldebaran in Taurus, the bull, shown rising just a little north of the east point. Next to it toward the left we find Auriga, the charioteer, with brilliant Capella.

Four Planets Visible

In addition to Jupiter, three other planets are visible for short periods. Mars, in the constellation of Scorpius, sets about 2½ hours after the sun, a little too soon to get into the maps. On Oct. 2 Mercury is farthest west of the sun, so for about a week around this time it is visible low in the east as dawn is breaking. Saturn, considerably fainter, is in the same part of the sky, and Mercury passes close by it at 4:00 a. m., EST, on Oct. 6.

At the beginning of the year when Jupiter was visible in the western sky at twilight, it was not where we see it now, but in the constellation of Capricornus, the sea-goat, next-door to the right from Jupiter's present home. Until about the middle of March the planet was too close to the sun's direction to be seen with ease. Then it appeared as a morning star, seen in the east before sunrise. With the change of the skies month after month it appeared earlier and earlier until midsummer, when

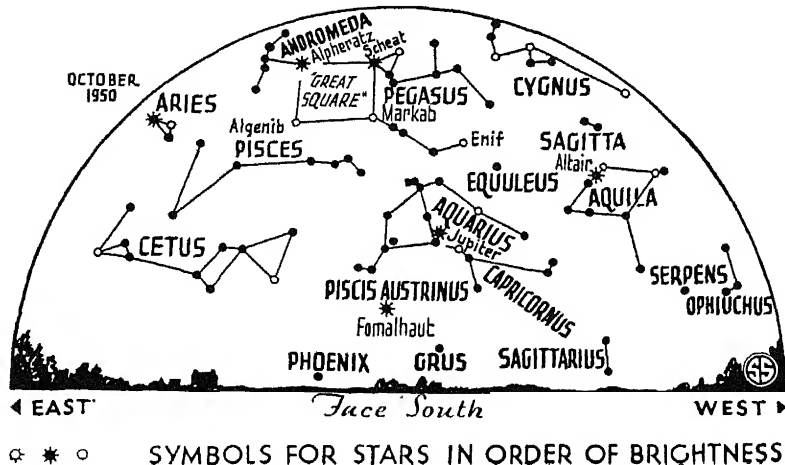
it began to be prominent during the evening as it is now.

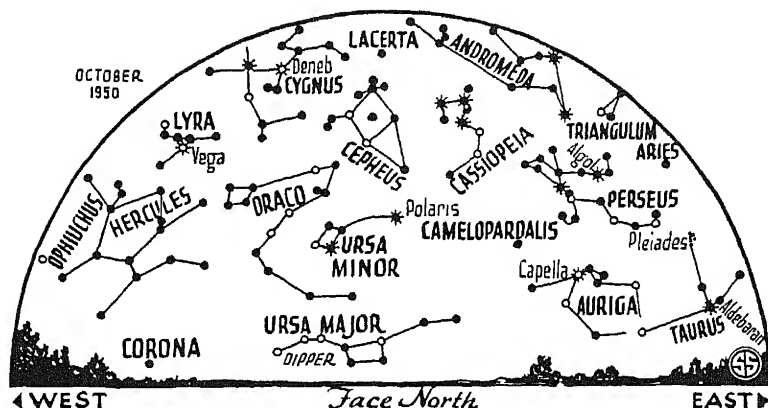
Until the end of June Jupiter's movement among the stars had been from west to east, taking it from Capricornus into Aquarius. But on June 27 it seemed to stand still and then to start back towards Capricornus again. On Oct. 24 it almost reaches the border of that constellation, but again it is stationary. One can see this during the month by noting its position with respect to the star in Aquarius shown just below the planet Altair. Oct. 24, its movement is again toward the east.

Movements of the Planets

Such movements of the planets were most puzzling to the ancient astronomers, who thought the earth to be fixed, with all the heavenly bodies revolving around it. That meant, if true, that when a planet seemed to go backwards for a time, it could really reverse its movement. One explanation that held sway for many centuries was the Ptolemaic theory. It was first proposed by a Greek astronomer, named Hipparchus, who lived on the island of Rhodes around 130 B. C.

Since a circle was considered the only "perfect" figure, it was supposed that the heavenly bodies had to move in circles. Hipparchus proposed that they moved in a series of circles. Jupiter, for example, revolved once every 399 days in a small circle called an epicycle. The center of this epicycle moved once in 12 years around a larger circle called the deferent, which had the earth at its center. Thus, the general progression was toward the east, though sometimes the movement in the small circle made it go westward for a time. The other planets moved on similar deferents and epicycles. As the planetary movements were further studied, it was occasionally found that a single epicycle would not explain





the observations, so others were added, one on top of another. Finally this became so complex that, as one famous astronomer remarked, "the music of the spheres became lost in a whirl of machinery!"

Theory of Copernicus

The theory of the Polish astronomer Copernicus, first published in 1543 and developed by others, brought a great simplification of this by having the earth itself as one of the planets, all of which revolve about the sun. According to these ideas, now known to be correct, the movements we observe in the skies are combinations of those of the object itself and this moving earth from which we make the observations.

As one travels in an express train and overtakes a freight on the next track, it may appear that the slower train is actually going backwards, though one knows they both are moving the same way. The nearer a planet is to the sun, the faster in miles per second is its speed. Consequently when we are in the same direction from the sun as Jupiter we overtake it. As we view it against the background of distant stars, it seems to be moving backwards for a time.

Time Table for October

Oct	EST	
1	12 28 a. m.	Algol (variable star in Perseus) at minimum brightness
2	8:00 p. m.	Mercury farthest west of sun, visible for a few days low in east at dawn
3	9 16 p. m.	Algol at minimum
4	2:53 a. m.	Moon in last quarter
6	4:00 a. m.	Mercury passes Saturn
	6:05 p. m.	Algol at minimum
9	9:28 p. m.	Moon passes Saturn
10	7:32 a. m.	Moon passes Mercury
11	8:33 a. m.	New moon
12	11:00 p. m.	Moon nearest, distance 300 miles
15	4:00 a. m.	Moon passes Mars
17	11:18 p. m.	Moon in first quarter
20	10:27 a. m.	Moon passes Jupiter
21	2:09 a. m.	Algol at minimum
22	early a. m.	Meteors visible from constellation of Orion
23	10:57 p. m.	Algol at minimum
24	9:00 a. m.	Jupiter stationary (has been moving west since end of June but now resumes easterly motion)

25	3 46 p. m.	Full moon
26	7:46 p. m.	Algol at minimum
28	3 00 p. m.	Moon farthest, distance 252,400 miles

Subtract one hour for CST, two hours for MST, and three for PST

Science News Letter, September 23, 1950

TEXTILE ENGINEERING

"Funginert" Materials Not Hurt by Fungi

➤ "TO SPOT the stuff that mold can't hurt

A new word's coined—say funginert"

And it is a word that means better, longer-lasting equipment of all kinds for the GI's in Korea. Soldiers have found that the ever-present fungi can cause severe damage to electrical equipment as well as many clothing materials. New materials, the funginerts, designed to have the property of not supporting fungus growth are replacing the older, more vulnerable ones.

The word was coined by Dr. Walter N. Ezekiel of the Navy Department's Bureau of Ordnance. Also suggested by him are parallel words, such as "bacterinert" and "microbinert." These would spot cases in which it is desired to describe materials inert to bacteria or to microorganisms in general, he states in the journal, *SCIENCE* (Sept 1).

Science News Letter, September 23, 1950

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VETERINARY MEDICINE

Accurate, Fast Test for Foot-and-Mouth Disease

➤ A FAST new test for one of the most dreaded viruses in the cattle world has come in Mexico's battle against foot-and-mouth disease.

This is the plague which closed the Rio Grande to all livestock shipments more than three years ago. The new technique of the U.S.-Mexican Aftosa Commission in pinning the disease down was reported at the meeting of the American Veterinary Medical Association by Drs. Fernando Camargo, Ervin A. Eichhorn, Jacob M. Levine and Alfredo T. Giron, all of Mexico City.

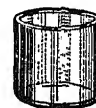
The new test has an error of less than one percent. It can tell the foot-and-mouth virus from a similar infection called *vesicular stomatitis*, and can correctly identify different strains of these diseases. It can cut to a few hours the time required to spot foot-and-mouth disease in specimens sent to the laboratory, and hence speed up the isolation of infected animals.

Veterinarians revealed these other new tricks:

Cortisone, the anti-arthritis wonder drug, is now being used successfully to treat cattle with ketosis, a disease marked by changes in the pituitary gland and adrenal cortex. The work was reported by Drs. J. C. Shaw, B. C. Hatzios and E. C. Leffel of the University of Maryland.

Dr. Myron Thom of Pasadena, Calif., said X-rays and radium can be used to treat lame race horses. Radiation helps the animal's system to flush away bacteria and debris in injured tissues, reducing pain and swelling and speeding natural repair processes.

Science News Letter, September 23, 1950



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GENERAL SCIENCE

U. S. Losing Science Race?

Our practices for control of subversives may cause the U. S. to lose ground in the science race. Scientific progress is based on free exchange of information.

➤ THE United States may lose out in the race to stay ahead of other nations in the field of science. If so, the blame will fall on the current government practices for the control of subversives. A warning that there should be a revision of the present loyalty and security programs was sounded in Ithaca, N. Y., by Prof. Walter Gellhorn of Columbia University in the book *SECURITY, LOYALTY AND SCIENCE*. This is the first in a series of eight reports to be issued by Cornell University on the impact on civil liberties of present practices to insure internal security.

"On the whole our national policies about secrecy in scientific matters are intelligently formulated. But the policies seem too inflexibly applied," Prof. Gellhorn states. "All history demonstrates that problems solved by the laboratories of one country ultimately yield to research in others, so that permanent bottling up of 'secrets' is a virtual impossibility," he continues.

Aimed at desirable objectives, the facts still remain that 1) the progress that produces our "secrets" depends on free exchange of scientific information; 2) scientific teamwork is unnecessarily hindered

by security regulations; 3) scientific research is often duplicated because normal communication channels are blocked off by "compartmentalization;" 4) science students are receiving "imperfect training" in basic subjects because there is not access to new discoveries and 5) that experienced scientists are discouraged from entering research in classified subjects by the "fear of smear."

Prof. Gellhorn makes a strong case for the revision of the loyalty and security programs he believes is necessary. Loyalty clearance should be reserved for "sensitive" areas, he declares. "The extension of personnel security clearances into areas in which they are not demonstrably necessary protects no national interest."

Discussing the Fuchs case, Prof. Gellhorn states that grave as was his dereliction of duty, his misdeeds might "still cost the United States less dearly than would excessively rigorous controls."

"American strength rests upon advance rather than upon nervous hoarding of present scientific knowledge," Dr. Gellhorn concludes.

Science News Letter, September 23, 1950

CHEMISTRY

Non-Mildewing Cotton

➤ MILDEW-resistant cottons for the battlefield or for the home are promised as a result of a theory advanced on how cotton is attacked by microorganisms.

A thin layer of resistant material would be the protective barrier, and would be produced by a chemical reaction on the surface of the fiber.

Also, Dr. Ralph G. H. Siu of the Quartermaster General Laboratories, Philadelphia, states, since the degree of resistance does not depend upon the nature of the coating material, it should be possible to use substances "which by their very nature possess other desirable characteristics, such as flameproofness, water-repellency and photo-chemical stability."

Although the studies so far have been carried out on a laboratory scale only, Dr. Siu suggests that in plants the finished fabric could be coated by passing it through a reagent bath and a baking oven.

The cotton fiber itself is a twisted ribbon about an inch long and a thousandth of an inch in diameter. It is covered with a thin outer layer and contains a large

central canal running the length of the fiber.

The cellulose of which the cotton is composed is attacked by either fungi or bacteria only at the point of immediate contact between the organism and the cotton fiber. Dr. Siu believes that the organism secretes chemical substances, or enzymes, that make the cellulose soluble. He calls these enzymes "cellulase."

Since the organisms do act only at the point of contact, surface or topochemical treatment of the fabric is practical, he reports (*TEXTILE RESEARCH JOURNAL*, May)

Science News Letter, September 23, 1950

METEOROLOGY

Rain to Continue On East Coast

➤ THAT rain the East had for the first two weeks in September will probably continue in amounts greater than normal during Sept. 15-Oct. 15 period. The U. S. Weather Bureau's Extended Forecast Section predicts greater than normal rainfall

not only for the east coast, but also for the Ohio Valley until Oct. 15.

West of the Continental Divide, it will not rain as much as it usually does during the mid-September to mid-October period. That goes for along the Gulf Coast, in Texas and in the upper Great Lakes region.

Fall weather, for the next few weeks, will be cooler than usual in the northern plains region, the midwest and the northeast. However, west of the Continental Divide, and in Florida and Texas, it will be warmer than normal until Oct. 15. Other areas of the country can expect temperatures to be just about as usual.

The abundant rainfall in the East, predicted on the first of September for the month of September, has amply borne out the forecast.

Science News Letter, September 23, 1950

GENERAL SCIENCE

Minority of Drivers Cause Most Accidents

➤ DEATHS from highway traffic accidents would greatly decrease if all drivers with bad accident records were debarr'd from driving.

Accident "repeaters" culprits are now recognized as the cause of most of our so-called accidents, it is stated in a study made in Minneapolis by the Northwestern National Life Insurance Company. Four out of every five so-called accidental deaths and injuries are "invited" or directly caused by people with "death-and-injury-producing habits."

Several surveys of traffic accident records are quoted in the study. During a six-year period in Connecticut, 4% of the state's drivers had 36% of the accidents. In other surveys in other states, it was found that from 5% to 10% of the drivers regularly contribute more than half the total traffic accidents.

British and American researches going back through 30 years of casualties have demonstrated that about 20% of the population consistently have 80% of all accidents of all kinds.

Drivers with repeated accidents almost always have accompanying records of repeated traffic law violations, the study shows. According to a study in Michigan, 100 accident repeaters had had 528 accidents and had been arrested 769 times for traffic law violations in a ten-year period.

A certain number of accident repeaters are found by various clinical tests to be abnormal personalities needing medical or psychiatric treatment. Some of the drivers were found to be defective in eyesight, hearing or muscular response. The vast majority, however, are simply persons with bad habits and wrong mental attitudes of resentment or contempt toward rules, regulations and common courtesy.

Science News Letter, September 23, 1950

ENTOMOLOGY

Potasan Punches Pests

➤ A NEW nerve-gas insecticide called E-838 or "Potasan" has joined the list of deadly chemicals which make the modern American farm a very dangerous place for the insects—and sometimes for the men who fight the insects.

"Potasan," a trade name, was described in Washington to scientists and government agricultural experts about to conclude the most far-reaching Federal hearings ever held on the chemicals used by U. S. fruit and vegetable growers.

The new insect poison is a close cousin of parathion, one of the most effective agricultural chemicals developed since World War II. Like parathion, E-838 was discovered originally by a German chemist, the brilliant Dr. Gerhard Schrader of I. G. Farben, during a wartime search for new poison gases.

Dr. Schrader produced the so-called "nerve gases," incredibly toxic compounds that were never used in the war. Among the same chemical family were substances which proved to be potent insecticides—parathion, TEPP, HETP and now E-838, developed within the past two years.

Present indications are that E-838 will deliver a Sunday punch to such costly U. S. farm pests as the Colorado potato beetle and the red spider mite, Thomas F. Cleary, official of the Chemagro Corp., testified at the Food and Drug Administration hearing.

He said the new poison (which has the tongue-twisting technical name of diethoxy thiophosphoric acid ester of 4-methyl-7-hydroxy coumarin) has been tested also against the costly codling moth in apple orchards, the Mexican bean beetle, Southern armyworm, cabbage worm, onion thrip and pea aphid.

Such phosphorus compounds, being linked to the nerve gases, are also extremely dangerous to man. The American Medical Association warned that extreme caution must be used in handling these new insecticides. Already they have caused deaths and numerous severe poisonings. Protective clothing as well as gas masks must be used in the field or orchard, for the chemicals can be absorbed through the skin as well as inhaled.

Evaluation of the health hazard to the U. S. consumer from these and other modern-day agricultural chemicals is the goal of residual tolerance hearings which began in Washington last January, and which ended Sept. 15.

More than 9,000 pages of testimony were taken. Experts from the U. S. Public Health Service, FDA, Department of Agriculture and most major U. S. chemical companies testified on the necessity as well as the possible danger of using chemical

weapons now available to fruit and vegetable growers.

Nearly all chemicals used as insecticides, fungicides and weed killers have been studied. Final goal of the project—after lengthy briefs have been filed by witnesses and a proposed set of regulations perhaps battled out in court—will be new Federal rules regulating the permissible amounts of chemical residues on fruits and vegetables traveling from truck farms and orchards to the nation's dinner table.

Science News Letter, September 23, 1950

PSYCHOLOGY

All Work, No Play Does Make Jack Dull Boy

➤ THE "All work and no play makes Jack a dull boy" saying gets scientific support from a study by Dr. Frederic T. Jung of Chicago, Ill. The report will particularly please the Jacks—and Jills—who complain about too much school work without enough vacations.

The study, made on students carrying accelerated courses at Northwestern University School of Medicine, also carries a warning to scholarly students. They, Dr. Jung found, are "inclined to slight their physical needs."

Both physical fitness and enthusiasm, Dr. Jung found, declined measurably during long uninterrupted periods of schooling, and both rose significantly during an interval that included a vacation.

Science News Letter, September 23, 1950

GEOLOGY

Plants 100,000,000 Years Old in Colorado

➤ TAKING his bearings by the fossils of strange plants millions of years old, a government geologist has pinned down the age of a slice of Colorado.

Dr. Roland W. Brown of the U. S. Geological Survey, in a professional paper published in Washington, reports that a rock layer covering uranium ore deposits in southwestern Colorado dates from the time when birds and flying reptiles first appeared on earth, and the time when dinosaurs and giant reptiles were becoming extinct.

Much of his detective work was done by studying plants preserved in the rock. These included cycads—plant half-way between tree ferns and palms—as well as ordinary ferns and flowering plants. Among his specimens, Dr. Brown says, are four species previously unknown, four plants which grew in Colorado perhaps 100,000,000 years ago in America's Cretaceous Age.

Science News Letter, September 23, 1950

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ZOOLOGY

NATURE
RAMBLINGS

Caterpillars

➤ IF humans could only control caterpillars with some sort of radio directing device, the drudgery of clipping hedges, mowing lawns, pruning trees and weeding the garden would be over for all time. Lucullus was a dainty eater compared to the caterpillar. With shearing jaw-action spurred on by prodigious appetite, this fuzzy little monster spends most of its young life chomping away at flowers, foliage, or food in the garden. He chews and chews and chews and chews. The more he eats, the bigger he grows, and the bigger he grows, the more he eats.

The coming of fall sends most caterpillars off to hibernation, spun in rough silky cocoons. But there are some which seem to care nothing for first hints of frost. Bristling little orange-and-black fellows, commonly called woolly bears, nonchalantly hump themselves across the sidewalk on warm September and October days. When winter does come, the woolly bear merely hunts himself a well-sheltered corner, curls up and goes to sleep without the formality of a silken sleeping bag. He dreams of early spring, when he will begin eating again, fattening up for the mysterious transformation into a butterfly or gauze-winged moth.

Caterpillars are unpleasant-looking creatures, except perhaps to other caterpillars. Some have gaily-colored coats, but many

more are naked, squidgy things, like the cabbage worm or green maple worm. The bigger they are, the more repulsive they are to the squeamish—the cecropia, with its rows of stiff, short bristles, the tobacco caterpillar, with its long horn to whack you if you meddle too persistently; the puss and the sphinx which rear up and try to stare you out of countenance.

The caterpillar's life is a hazardous one. His soft, helpless, juicy body is a choice morsel for birds, wasps, ants and other insects. Fungi prey upon him, and man attacks him with poisonous chemicals. But his most terrifying enemy is the family of parasites which likes nothing better than to eat him alive from the inside out.

At Yale University this summer, a giant horde of orange and black caterpillars

threatened for a time to strip away every trace of ivy from the sleeping walls. Then nature sent in her shock troops. Countless flies appeared; like low-flying bombers, they deposited their eggs just behind the caterpillars' heads.

The eggs hatched into tiny white maggots in a few days. Straight-away the larvae burrowed into the bodies of the caterpillars, fastening themselves on the tissues of their unwilling hosts, growing larger as they fed.

At the last, discouraged, sick and robbed of the fat built on ivy leaves, the caterpillars one by one stopped eating, their brilliant stripes turned to a dull yellow, and they fell from the tattered ivy to the ground.

Science News Letter, September 23, 1950

RADIO

Hams Aid Invasion Plans

➤ PLANNING communications for large-scale invasions, such as that at Normandy, will be greatly aided by studies being made of reports from "hams," or amateur radio operators.

Rapid communication between field units and headquarters is particularly essential during an invasion. If normal radio channels are blacked out by severe atmospheric storms, there must be emergency ones that can be used immediately.

Every now and then, to a ham's delight, he will be able to contact another operator far beyond his usual range. Until recently no systematic record was kept of these unexpected conversations beyond the normal contact range, other than for the ham's purpose of learning which operator had talked with the most persons and at what distances.

Last year, however, the hams were asked to report their contacts at unusual distances to O. P. Ferrell of the Scientific Radio Observation, Inc., in Philadelphia.

N. C. Gerson of the Air Force's Cambridge Research Laboratories has now reported in the journal, *NATURE* (Aug. 19), the first results of analysis of the data sent in by hundreds of amateurs.

Wavelength used by the hams was 50 megacycles. Most radio waves, such as those used for daily broadcasts, are reflected back to earth from the ionosphere. The 50 megacycle wavelengths, however, pass right through these reflecting layers. But if there is intense ionization in the region known as the sporadic E-layer, the 50 megacycle waves will be reflected back to the earth.

It works like this: At 10:00 one night, Joe in Cleveland makes contact with Jim in San Antonio; at 10:30 with Dick in Denver; but he cannot during this time make contact with operators in Miami, approximately the same distance as Denver, but in a different direction. He reports these facts.

Analysis of hundreds of reports, including both contacts made and those that were attempted but not successful, gives the information about how fast the sporadic E-layer is moving and in what direction.

As more is learned about this layer, frequencies can be assigned for emergency use when the normal ones are blacked out by atmospheric storms.

On May 15, 1949, four very definite sporadic E-layer regions were found above the United States. They seemed to move at a speed of about 100 to 200 miles per hour. "The possibility of some type of anticyclonic motion in the upper atmosphere is suggested," Mr. Gerson states, by the combined motions of two of the areas with respect to the other two.

Science News Letter, September 23, 1950

GENERAL SCIENCE

Life-Span of Wage-Earners, Families Increasing

➤ LENGTH of life for the American wage-earners and their families has been steadily increasing for the past half-century and more.

Expectation of life at birth is now 67.7 years for the many millions of industrial policy-holders of the Metropolitan Life Insurance Company. Average lifetime among this large section of the industrial population has doubled since 1879-1889, earliest period for which figures are available.

The improvement in mortality and longevity during the past 40 years has been greater in the industrial population than in the population of the United States as a whole.

"This achievement of the rank and file in our country," the life insurance statisticians point out, "has broad implications and gives added meaning to the phrase, 'the American way of life.'"

Science News Letter, September 23, 1950

HOUSES OF EARTH

The ground you stand on is your best building material. Easy to build—insulated against heat and cold. Ratproof—Soundproof—Termiteproof and Fireproof. Book based largely on findings of the Bureau of Plant Industry, Soils and Agricultural Engineering. Low Building and Upkeep costs.

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AUSTRALIAN JOURNAL OF APPLIED SCIENCE, Vol. I, No. 1—N. S. Noble, Ed.—*Commonwealth Scientific and Industrial Research Organization*, quarterly, 132 p., in Australian money: 30 shillings per year (Approx. \$3.36 in U. S. money). The purpose of this journal is to report results of original investigations in the field of applied science.

AUSTRALIAN JOURNAL OF MARINE AND FRESHWATER RESEARCH, Vol. I, No. 1—N. S. Noble, Ed.—*Commonwealth Scientific and Industrial Research Organization*, issued as material becomes available, 154 p., illus., in Australian money: 7 shillings, 6 pence (Approx. 85 cents in U. S. money). Primarily designed to report results of original investigations on sea and freshwater fisheries and related subjects.

AUTOMATIC AND MANUAL FIRE ALARM SYSTEMS: Inspection, Tests and Maintenance—War Department—U. S. Dept. of Commerce, Tech. Manual TM 5-696, 66 p., illus., paper, \$1.75. A manual covering certain general principles relating to the inspection and maintenance of building fire alarm systems.

AUTOMOBILE FACTS AND FIGURES—*Automobile Manufacturers Association*, 30th ed., 80 p., illus., paper, free upon request to publisher, Transportation Building, Washington 6, D. C.

CALORIE REQUIREMENTS. Report of the Committee on Calorie Requirements, Washington, D. C., U. S. A., 12-16 September 1949—*Food and Agriculture Organization of the United Nations* (U. S. Distributor: Columbia University Press), illus., paper, 75 cents.

COLLOID CHEMISTRY: Theoretical and Applied, Vol. VII—Jerome Alexander, Ed.—*Reinhold*, 736 p., illus., \$15.00. A compilation of papers written on theory and methods, biology, medicine and technology by many international contributors such as Charles A. Southwick, Jr., Alexander S. Wiener and Jerome Alexander.

THE CONTROL OF COMMUNICABLE DISEASES IN MAN: Report of a Committee of the American Public Health Association—*Gov't Printing Office*, Reprint No. 1697 from the Public Health Reports, 159 p., paper, 40 cents.

ENGINEERING ECONOMY—H. G. Thuesen—*Prenice-Hall*, 501 p., illus., \$6.65. A book to aid economic analyses of engineering problems.

EROSION STUDIES AT PARICUTIN, STATE OF MICHOACAN, MEXICO—Kenneth Segerstrom—*Gov't. Printing Office*, Geol. Survey Bull. 965-A, 164 p., illus., paper, \$1.00. Many valuable maps and illustrations of this well-known volcano are included.

FLORA OF ILLINOIS: Containing Keys for Identification of the Flowering Plants and Ferns—George Neville Jones—*University of Notre Dame Press*, 2nd ed., 368 p., \$4.25.

FORAGE AND PASTURE CROPS: A Handbook of Information about the Grasses and Legumes Grown for Forage in the United States—W. A. Wheeler—*Van Nostrand*, 752 p., illus., \$10.00.

FOREST PLANTATIONS IN THE LAKE STATES—Paul O. Rudolf—*Gov't. Printing Office*, U. S. Dept. of Ag. Tech. Bull. No. 1010, 171 p.,

illus., paper, 45 cents. A report of the upkeep of forests in the states of Minnesota, Wisconsin and Michigan.

GEOLOGY AND GROUND-WATER RESOURCES OF RICE COUNTY, KANSAS—O. S. Fent—*State Geological Survey of Kansas*, 142 p., illus., 25 cents mailing charge per copy. A report describing the geography, geology and ground-water resources of Rice County in central Kansas. A map is included.

GEOLOGY OF THE COASTAL PLAIN OF NORTH CAROLINA—Horace G. Richards—*American Philosophical Society*, 83 p., illus., paper, \$1.50. This report covers the formations from the Cretaceous to the recent.

A HISTORY OF CHINA—Wolfram Eberhard—*University of California Press*, 374 p., \$4.50. The fundamentals of the Chinese social system and of Chinese history.

INDIANS OF THE LONGHOUSE: The Story of the Iroquois—Sonia Blecker—*Morrow*, 160 p., illus., \$2.00. A children's book telling how the great Iroquois nation lived before the white man invaded it.

THE NEW YORK STATE DEPARTMENT OF MENTAL HYGIENE PRESENTS CHIC YOUNG'S BLONDIE. In Scapegoat, Love Conquers All, Let's Face it and On Your Own—Joe Musial, producer—*Department of Mental Hygiene, State of New York*, approx. 14 p., illus., paper, free upon request to publisher, Albany, N. Y., to those recognized agencies and organizations interested in the promotion of mental health. The well-known comic strip characters of Chic Young's BLONDIE have been put to work to demonstrate four basic mental hygiene principles.

PHYSIOLOGY AND ANATOMY—Esther M. Greisheimer—*Lippincott*, 6th ed., 841 p., illus., \$4.00. A standard college text brought up-to-date.

PNEUMOCONIOSIS: Beryllium Bauxite Fumes—Compensation—Arthur J. Vorwald, Ed.—*Hoebel*, 659 p., illus., \$7.50. A record of the Sixth Saranac Symposium held in the fall of 1947 considering many aspects of beryllium and bauxite fumes as they relate to industrial health.

SEA SLANG OF THE TWENTIETH CENTURY—Wilfred Granville—*Philosophical Library*, 271 p., \$3.75. A dictionary of British naval slang.

SECURITY, LOYALTY, AND SCIENCE—Walter Gellhorn—*Cornell University Press*, 300 p., \$3.00. A study of the administration of security policies in "sensitive" areas. (See SNL, Sept. 23, p. 204).

SIR WILLIAM OSLER APHORISMS FROM HIS BEDSIDE TEACHINGS AND WRITINGS—William Bennett Bean, Ed.—*Schuman*, 159 p., \$2.50. Observations on the practice of medicine made by Dr. Osler.

SONG OF THE SEASONS—Addison Webb—*Morrow*, 127 p., illus., \$2.50. Child's book telling how the seasons affect animals.

A TEXTBOOK OF BIOCHEMISTRY—Philip H. Mitchell—*McGraw-Hill*, 2nd ed., 695 p., illus., \$6.00. A college text brought up-to-date.

THEORY OF ELEMENTARY CHEMICAL ANALYSIS—Thomas H. Whitehead—*Ginn*, 233 p., illus., \$2.75. A basic analytical chemistry textbook which includes material for both qualitative and quantitative inorganic analysis.

VOLCANOES OF THE PARICUTIN REGION MEXICO—Howel Williams—*Gov't Printing Office*, Geol. Survey Bull. 965-B, 279 p., illus., paper, 65 cents. A brief history well illustrated with maps and photographs.

WATER AND MAN. A Study in Ecology—Jonathan Forman and Ollie E. Fink, Eds.—*Friends of the Land*, 407 p., illus., \$4.50. A monograph on man's use and care of water. Science News Letter, September 23, 1950

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⚙️ **BUTANE LIGHTERS** for smokers, using the butane gas which is delivered in tanks to thousands of homes for cooking purposes, have replaceable cartridges of the gas which hold a supply great enough to last several months. This light-weight lighter has no wick, fluid or odor.

Science News Letter, September 23, 1950

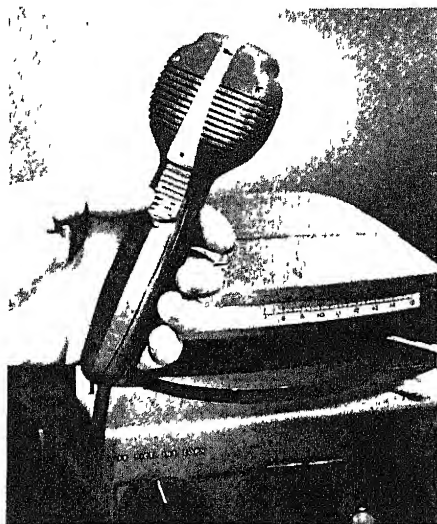
⚙️ **ZIGZAG ATTACHMENT** for sewing machines makes easy the job of zigzag stitching on home-made garments, and produces results from almost invisible stitching to boldly decorative effects. Straight stitching, without removing the attachment, is obtained by a lever adjustment.

Science News Letter, September 23, 1950

⚙️ **BICYCLE ENGINE**, a British product claimed to give about 250 miles to a gallon of gasoline, is a two-stroke engine that comes mounted on a special wheel to replace the regular rear wheel. The replacement can be fitted to any bicycle, and weighs a total of 20 pounds.

Science News Letter, September 23, 1950

⚙️ **PLASTIC MICROPHONE**, for use with an office dictating machine, not only receives dictation but will play back the last words for review. When a switch,



shown under the thumb in the picture, is pushed up the machine records. For playback the switch is pushed down.

Science News Letter, September 23, 1950

⚙️ **ALUMINUM CONTAINER**, for home and other canning, is a German development similar to the long-used glass jar with lid, rubber sealing ring and clamp. The

aluminum is protected from chemical action due to contact with the food by a protective lacquer.

Science News Letter, September 23, 1950

⚙️ **CARD SHUFFLER**, for canasta players, is claimed by the manufacturer to shuffle cards 40 ways in one speedy operation and offer them cut ready for play. It is a device easily operated by the amateur, and is an ideal box in which to keep cards.

Science News Letter, September 23, 1950

⚙️ **ELECTRIC POWER generator**, for medium-power dielectric heating in work with plastics, wood, rubber, textiles and food, is push-button operated, motor-driven and has a self-contained power output control. It utilizes a line voltage of 230 volts and employs two heavy-duty air-cooled power tubes.

Science News Letter, September 23, 1950

⚙️ **FLASHING SIGNALS**, to give warning of an automobile turn, are easily installed with a kit which contains everything needed to convert front parking lamps and rear tail lights to do the job. Turn signals are operated by a switch on the steering wheel.

Science News Letter, September 23, 1950

Do You Know?

The coconut is one of the largest seeds in the world.

Japan's tea production is now about 60% of its prewar amount.

Giant redwood trees of the West started from tiny seeds about one-sixteenth of an inch long.

Over 200,000,000 pounds of copper and its alloys will be used in America this year in household labor saving devices.

Addition of castor oil to the paint used in marking highways improves sticking qualities and prevents chipping off.

Ancient Hebrew manuscripts, found recently in rolls of leather and papyrus in a cave near the Dead Sea, are said to be at least 20 centuries old.

Cotton, jute, rice and tea will be sent from Pakistan to Poland under a new trade agreement, and Poland will send the Asiatic nation coal, chemicals, textiles and minerals.

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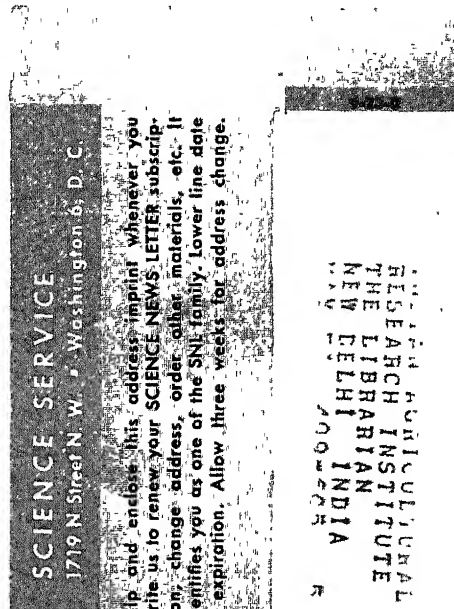
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THE WEEKLY SUMMARY OF CURRENT SCIENCE

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See Page 214

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A YEAR

VOL. 58 NO. 14 PAGES 209-224

MEDICINE

Blood Safety Questioned

Cases of jaundice, believed traceable to virus in blood plasma, are reported, but health and medical authorities are satisfied irradiation is effective when properly done.

➤ THE SAFETY of human blood plasma that has been treated with ultraviolet light to destroy possible jaundice virus in it is questioned by three groups of doctors reporting in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Sept 16).

Eighteen cases of this kind of jaundice, known medically as homologous serum hepatitis, are reported. In all cases, the doctors reporting believe the sickness was due to virus in the plasma given the patients for other illnesses.

But, says an editorial in the same issue of the A. M. A. Journal, "physicians should not withhold blood or plasma from any patient because of these adverse reports; however their indiscriminate use should be discouraged."

Discovery that the virus of this hepatitis could be inactivated in blood serum by ultraviolet irradiation and that the plasma was not otherwise affected led to adoption of ultraviolet irradiation as the official method of sterilizing plasma. During the two years since then, the Journal editorial points out, only a few sporadic cases of hepatitis have been reported following extensive use of irradiated plasma.

Officials at the National Institute of Health in Washington state they are satisfied that irradiation, properly done, is effective for sterilizing plasma and that they will continue to require it for all blood products for the armed forces and civilian use.

Hepatitis, meaning inflammation of the liver, may come from various causes. In this particular condition it is caused by a virus. The yellowing of skin and whites of the eyes known as jaundice is a symptom of this and of other liver diseases.

Not all persons have this virus in their blood. There is no laboratory test for the virus in blood, and no laboratory animal is susceptible to it. Scientists at the U. S. National Institute of Health have even tried silkworms in the hope of finding a laboratory animal that could be used to test human blood for this virus. The silkworms, however, did not prove susceptible to the virus.

Processors of plasma, the A. M. A. Journal advises, should screen blood donors carefully, eliminating those with a history of suspicious illness or contact with hepatitis. Equipment for irradiating the plasma should be continuously checked for efficiency. Needles and equipment used for collecting blood must be sterilized by autoclaving or boiling. Users of plasma, in hospitals or private practice, should be

equally careful about the sterility of all materials used to puncture the skin or to collect blood. Needles used in giving the plasma might be a source of the virus if not sterilized.

A more direct test for the virus-killing effect of ultraviolet irradiation should be sought, the medical journal also points out. At present a sample of plasma that has been irradiated is seeded with a test bacillus and again irradiated. If the test organism has been destroyed, this is considered proof of the efficiency of the irradiation sterilization.

Science News Letter, September 30, 1950

EDUCATION

Hollywood Tricks Do Not Aid Film Learning

➤ HOLLYWOOD tricks to capture attention in instruction films do not help learning. They may interfere with it.

Two groups of 1,055 naval trainees and 1,576 army recruits saw one of five versions of a training film on use of machine-shop measuring tools or they saw no film at all. All were later given an information test on the film's content.

Results of the test were reported in State College, Pa., to the American Psychological Association by Dr. D. Morgan Neu of Pennsylvania State College.

The group that saw no film at all got lower scores than those who saw the film. The version with no attention-getting devices was as effective if not more so than the jazzed up versions. The versions containing irrelevant visual material or irrelevant sound may have interfered with learning.

Devices like ultra close-ups, spot-lighting, and pointing do not necessarily help learning, it was found.

Science News Letter, September 30, 1950

ENGINEERING

Grinding Tough Materials Easy with Liquid Nitrogen

➤ THE TOUGHEST materials can be ground to a powder by a process which utilizes liquid nitrogen developed by the Linde Air Products Company of New York.

The function of the liquid nitrogen, which is used in spray form, is to cool the material to be pulverized to a point of maximum fragility. The new process can be used to pulverize rapidly mechanically-

tough or heat-sensitive materials such as plastics, pharmaceuticals, insecticides, food stuffs, substances containing vitamins and other organic materials

In operation, liquid nitrogen is injected into a chamber between the feed hopper and a high-speed stainless steel pulverizing mill. The fine liquid nitrogen spray plays on the material passing through, cooling it to a low temperature

It has not been found necessary as yet to cool materials to the temperature of liquid nitrogen, approximately 320 degrees below zero Fahrenheit. One great advantage in using liquid nitrogen instead of some other liquefied gas is that nitrogen is an inert element and does not react chemically with materials being ground.

At the present time, liquid nitrogen grinding is limited to high-cost materials that are able to absorb the added grinding cost. An important use will be in grinding materials that might be changed in one way or another by the heat generated by high-speed grinding

Materials with low melting points, as an example, normally overheat and prevent continuous grinding, or sometimes the grinding results in torn rather than sharply defined particles. The inert nitrogen atmosphere will be of aid in grinding explosives and oxidizable materials. A low temperature mill will prevent loss of aromatics and volatiles.

Science News Letter, September 30, 1950

GENERAL SCIENCE

Corporation Reports Understood by 1 out of 4

➤ THE ANNUAL reports of billion dollar corporations cannot be understood by 75 out of 100 American adults

This was the report of Drs. Siroon Pashalian and William J. E. Crissy, of New York University and Queens College in New York, based on a study of the readability of samples taken from 26 such reports

On the whole, they found, the general level of reading is difficult. The human interest value is "dull"

One difficulty was in the use of large numbers of figures. When from 10 to 20 figures appear in a single 100-word sample of text, the author should take warning and think about putting them in a table or chart, the investigators suggest.

Corporation reports should pay more attention to individual personalities, the investigators urge.

"People are interested in people," they conclude. "They want to become better acquainted with the outstanding personalities of the corporation. Yet, among the 21,100 words sampled in this study only 20 names were mentioned."

Personalities were largely confined to obituaries.

Science News Letter, September 30, 1950

PSYCHOLOGY

The armed forces qualification test, criticized as being too difficult, tests what it is designed to test. The men simply are not qualified.

➤ THE ARMED forces qualification test jumped on by Maj. Gen. Lewis B. Hershey, head of Selective Service, as flunking too many men, is doing just what it is designed to do, Army records indicate.

This test is designed to keep out of the Army those men who are so stupid or ignorant that they would do the Army more harm than the enemy itself. Difficulty of the test was planned so as to disqualify 13% of men of draft age. It is just that proportion of the population that is too low in intelligence or education to make good soldiers, Army figures indicate.

Actual rejections during the month of July for failure on the mental test amounted to 15.2%, a figure slightly higher than the expected 13%. But the drafted men sent to the Army were not representative of the whole population. Screened out were all those who had enlisted in the Navy or Air Force, all veterans, all college boys who were in the upper 50% of their classes, and all R. O. T. C. students.

Passing mark on the test was not set by the Army, it was set by Congress in the Selective Service Act of 1948, where it is provided that the Army should accept all men who make a score better than 70 on the old Army General Classification Test.

By giving the new all-services test to 12,000 men who had also taken the old GCT, an equivalent on the new test for the grade of 70 on the old one was found. This is the new cutting point.

The new test, which has been in use since Jan. 1 of this year, is the answer to a demand that all the armed forces have one single scale for measuring the talents of their men. It was prepared by experts from the personnel research section of the Army and from equivalent offices in the Navy, Air Force, Marine Corps and Coast Guard. Practically all the experts who worked on the test had seen service during World War II; the rest had been civilian employees of the Armed Forces during the war.

The test is designed to measure native intelligence, that is, the ability to learn what a soldier needs to know, and also ability to read simple instructions.

Care was taken to make the instructions in the test clear and simple to understand. Every word used was looked up on the famous Thorndike list of word difficulty, and no word was included that was above fourth grade difficulty.

Three kinds of questions are included in

the test. One kind is arithmetic reasoning, none of the questions beyond eighth grade in difficulty. Some questions test knowledge of words. And then there are questions that measure ability to sense spatial relations. This is measured, for example, when a drawing shows the surface of a construction of irregular form built of blocks. The candidate is asked to count how many blocks were used to build the form. Ability to do this has been found to be a good index to ability in certain occupations such as that of automobile mechanic.

Before being used in the test, every single question was first tried out in recruiting offices throughout the country to find out

its difficulty. Trials were made on two and a half times as many questions as were actually used. Those selected were found to distinguish best between good soldiers and poor soldiers.

The test as a whole was then tried out on 12,000 men who were representative of all the armed services in the last year of the war.

Whenever a man fails the mental test, he is immediately checked up on to see whether or not he is goldbricking. His work record and history of schooling, as provided by his own draft board, are examined. If it is found, for example, that he has graduated from high school, he is in the Army regardless of his score on the test. Less than one high school graduate out of a hundred should fail this test. Also if he has held a good job, that is considered as evidence that he is not deficient in intelligence, no matter what his test score.

If, however, he has a history of never being able to hold a job or to stay in school, that is considered to indicate that he would not be a good man in the Army.

Science News Letter, September 30, 1950

MEDICINE

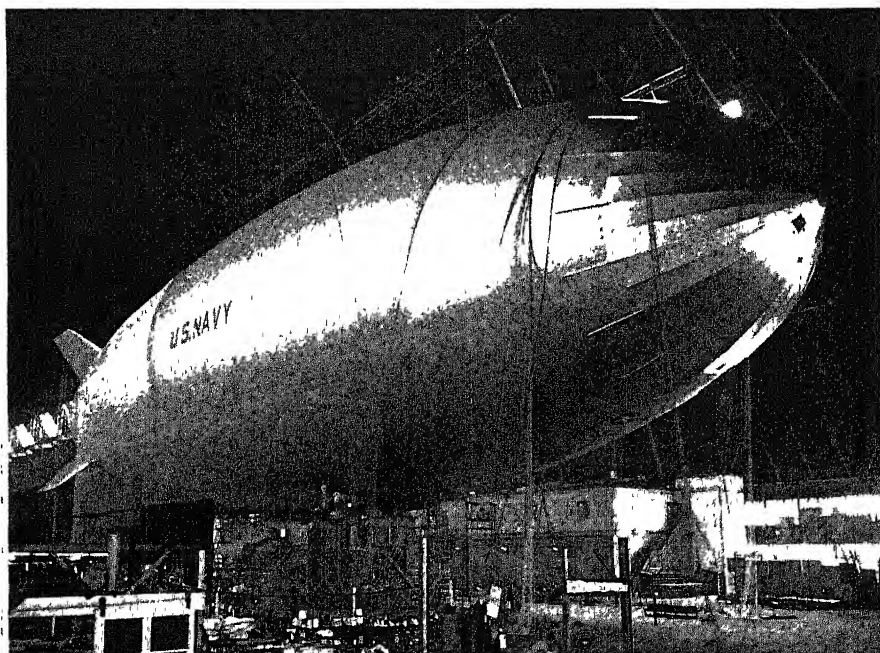
Two Medical Firsts

➤ TWO medical firsts are reported from the Naval Medical Center at Bethesda, Md.

A mental patient who choked himself to death was one of the firsts reported by Drs. Morton J. Aronson and Samuel V. Thomp-

son, of the Neuropsychiatric Section.

The other was a patient saved from death after his temperature had gone up to 106 degrees in a state of acute excitement. Extremely high temperatures are not unusual



ANTI-SUBS—The ZPN airship, newly developed for the U. S. Navy, will help to combat the submarine menace in the event of future war. The net, shrouding the huge ship, is used to hold the helium-filled envelope down while the control car and other fixtures are being attached.

in patients in catatonic excitement, when the temperature mounts rapidly and in a few minutes may go as high as 110 degrees. These cases usually die.

This patient was saved by rapid action on the part of the physicians. In addition to treatment with antibiotics, barbiturates and large doses of vitamins, he was given adrenal cortical extract. Practically continuous alcohol sponge baths were given him. Electric shock treatment was tried.

Gradually the temperature went down, the excitement subsided and blood pressure and chemistry returned to normal. The patient recovered with no memory of what he had been through.

The other patient, after repeated suicide threats, suddenly went wild on his birthday and threw himself about his room. He had to be restrained from mutilating himself. Then he stuck out his tongue and clamped his teeth down on it and held his breath. During one such spell of breath holding, his heart stopped beating.

Artificial respiration and injection of stimulants failed to restore him. He was dead.

The physicians' full report on these two patients is contained in the current *AMERICAN JOURNAL OF PSYCHIATRY* (Sept.).

Science News Letter, September 30, 1950

AERONAUTICS

Plane Wings without Rivets From New Forging Process

➤ **RIVET-LESS** wings for airplanes, constructed by a new forging process that saves cost, time and metal in the manufacture of wing panels, were revealed in Dayton, Ohio, at the Wright-Patterson Air Force Base.

The process was developed by the Air Materiel Command's Industrial Planning Division, the Lockheed Aircraft Corporation, Burbank, Calif., and the Wyman-

Gordon Company, Worcester, Mass. It utilizes specially designed dies and a vertical hydraulic press to forge one-eighth inch thick integrally-stiffened wing skins, thus eliminating the need for riveted reinforcements.

With present wings, there may be up to 15,000 rivets in a wing surface. Cost of both rivets and installation is wiped out by the new forging method. There is also a great saving in the amount of aluminum required for fabrication when it is machined out of solid stock. In the old process a large percentage of the aluminum ends up as trimmings and chips which must be returned to manufacturers for reuse.

The new rivetless panels are being manufactured in the plant of the Wyman-Gordon Company. A German scientist, Karl Braeuninger, assigned to the Air Force, is in charge of the project.

Science News Letter, September 30, 1950

AGRICULTURE

Giant Fruits Aid Plant Genetic Study

➤ **SCIENTISTS** at Geneva, N. Y., like nothing better than to open their mail and find apples the size of grapefruit or grapes which look like small plums.

As fall's harvest season approached, Dr. John Einset of the New York State Agricultural Experiment Station sent out a call for such giant fruit, or "sports" as they are called. If you find an elephantine apple or a king-sized grape, you can aid in a long-range study of uncommon plant genetics.

Send the fruit to the Geneva station for examination, and carefully mark the tree or vine where you found it. Describe the fruit briefly and give the name and address of the grower on the postcard to the experiment station.

True apple "sports" are often twice normal size, flatter and irregular in outline.

The tree on which they grow usually has thick twigs and a flat, bushy shape. Grape vines with unusual ambition sometimes turn out grapes twice the size of those on a neighboring vine. The reason is an unusual combination of the tiny bodies in the germ cells called chromosomes. These determine hereditary characteristics in plants and animals alike.

Science News Letter, September 30, 1950

SCIENCE NEWS LETTER

VOL. 58 SEPTEMBER 30, 1950 No. 14

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STAtE 4439.

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MEDICINE

Malady of Our Times

High blood pressure personalities are characteristic of the era in which we live. Such persons need to find their individuality and adjust in the best way to demands.

► THE HIGH blood pressure personality is "characteristic of our times," Dr. Robert Sterling Palmer of Massachusetts General Hospital, Boston, declares in a report to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Sept. 23).

"Practicality, objectivity and adaptability" are the chief characteristics of high blood pressure personalities, he finds from a study of 50 patients. The study, he points out, was made by a physician specializing in internal medicine, not by a psychiatrist.

"Originality, special skills and even special interests are conspicuous by their absence," he reports.

The personality pattern he found in the 50 high blood pressure patients is not specific for high blood pressure. It is the "personality's protective coloring induced by the prevailing normal climate."

"Tension results when this outer coat does not fit the patient's inner disposition," he states.

This tension is not specific for high blood pressure, either, but "contributes importantly to the development of other diseases of civilization."

"The task is first to assist the patient in finding his own inner individuality and second, to adjust it as best he can to current demands. This cultural factor in the causation of the disease presents a problem, doubtless insurmountable in one or several generations. This is not a reason for failure either to state the problem or to attempt to do something about it."

Dr. Palmer worked out a technique for inducing strain in patients with high blood pressure. It consisted in having the patient leaf through a 45-page loose-leaf notebook. On the first pages of the notebook are given simple statements about heart disease, high blood pressure and the outlook for patients with this condition. On each of 20 pages is printed the statement of a painful life situation or event from the history of an actual patient with high blood pressure. Outlines of 11 brief case histories of patients, especially in their psychosomatic aspects, are then given.

The patient reads, comments and asks questions. The blood pressure is taken at one or two minute intervals. When a rise in blood pressure, a telltale change in ex-

pression or position or some comment shows that something in the booklet has struck home, the doctor and patient can discuss it. In this way the doctor and patient both learn what emotional disturbance may be causing the high blood pressure in this particular patient. From this, methods of relieving the stress and the anxiety about the high blood pressure may be worked out.

Science News Letter, September 30, 1950

ENGINEERING

Develop New Type Conveyor Belt for Industry

► U. S. STEEL rolled out a new type of industrial conveyor on which loads move automatically to dead center and stay there.

Invented by E. T. Lorig, chief engineer of Carnegie-Illinois Steel Corp., a U.S. Steel subsidiary, the conveyor is a pathway of steel rollers. On each axle are twin rolls, each tapered slightly from the center out, but tilted so their working surfaces form a straight line.

The net effect is a "toe-in" force toward the center of the conveyor. As an object moves along the rolls, friction centers it exactly. The engineers dubbed the principle "planar action." Conveyors based upon this principle are already at work in several U.S. Steel plants. The rolls are being manufactured by Carnegie-Illinois in Johnstown, Pa.

Science News Letter, September 30, 1950

ARCHAEOLOGY

Monks Slowly Rebuild Destroyed Monastery

► THE SOUND of the pick and shovel are familiar to any archaeologist. Those who have dug up ancient cities know the task of trying to assemble broken pots, cuneiform tablets, stone inscriptions, life-size marble statues or mosaics.

At Monte Cassino, of World War II fame, emerges a new romance to archaeology. On top of this mountain overlooking the plains across which American troops fought for merciless weeks, the sound of the stone hammers beats a tattoo. The monks are rebuilding their monastery according to ancient plan. Here lie thousands of fragments made by recent steel shells and explosives—all being restored like a giant mosaic.

In one corner of a courtyard a black-robed monk is assembling carved marble blocks according to his pen and ink sketch of the way they were before the bombs came.

The chapel was demolished by shell-fire, but the tomb containing the bones of the monks' patron, Saint Benoit, was unharmed. A dud landed three feet away; this has been left where it fell, its nose buried in the ground. A passer-by might



DEFIES GRAVITY—By a 20-degree uptilt of his circular conveyor model, E. T. Lorig defies the laws of gravity. Inventor of the self-centering roll, he demonstrates the strong centering action on objects of various sizes, shapes and weights. The conveyor consists of a nest of split conical rolls individually driven.

refer to this as a miracle.

In the local museum reconstruction drawings of sections of the Monastery by the monks have been framed. These are the working models.

As soon as hostilities ceased, the rebuilding of the Monastery at Monte Cassino be-

gan. Five years later considerable progress has been made, but it will require perhaps 20 years to complete the restoration.

Those who work on this project, including monks, stone masons and craftsmen, are discovering the romance of modern archaeology.

Science News Letter, September 30, 1950

CHEMISTRY

Alkali in Fine Varnish

The silicon in the varnish used by Stradivarius came from wood ashes. Now the secret of the "lost art" is solved, and this fine varnish can be duplicated.

➤ ALKALI extracted from wood ashes is part of the "lost art" of making old Italian varnish used centuries ago by Stradivarius, the Amati and other famous violin makers, Joseph Michelman of Cincinnati, Ohio, discovered.

Following this method, Mr. Michelman has been able to recreate a varnish similar both in appearance and chemical composition to the old Italian varnishes.

Through spectrographic analyses of samples of the old varnishes, made with the aid of Alan Goldblatt of Chicago, Mr. Michelman had previously discovered the principal elements in the brown varnish. These were aluminum, iron, silicon, sodium, calcium, magnesium, lead and manganese, in the order named. Aluminum, iron and silicon were present in all 12 specimens of brown varnish analyzed.

The "unexpected and constant appearance of silicon was perplexing," Mr. Michelman states.

He could account for the presence of the other elements but not for the silicon. And until this was accounted for, rediscovery of the so-called secret of Stradivarius could not be held valid.

By study of methods used by the old alchemists and apothecaries as recorded in writings of the years 1550 to 1750, before and during the period when the old Italian varnish was in existence, Mr. Michelman came on a satisfactory explanation for the silicon in their varnish.

Briefly, this is that the alkali they used to dissolve resin was extracted from wood ashes with water and lime. Silicon compounds are always present in wood ashes, and this, Mr. Michelman suspected, was the source of the silicon in the old Italian varnish.

Details of the duplication of the old method of making varnish are reported in the journal, SCIENCE (Sept. 22)

Science News Letter, September 30, 1950

ASTRONOMY

Mars Day Sky Is Deep Blue

➤ AN OBSERVER located on the surface of Mars would find a deep-blue daylight sky, Dr. Donald H. Menzel of Harvard University stated in an address to a special meeting of the Royal Astronomical Society in Dublin, Ireland.

"The polar caps of Mars are not great blocks of ice, but mere fields of hoarfrost, ice crystals like those on a windowpane or in the freezing compartment of an electric refrigerator. Their thickness is probably only a fraction of an inch and, during the long Martian summer, the frost caps slowly evaporate, without melting," he stated.

Unlike the earth, where only a minute fraction of the available moisture occurs as atmospheric vapor, Mars has a very sizable fraction of its moisture in the atmosphere. Even so, the humidity is extremely low—less than one-tenth of one per cent on the average, he said.

Once the polar cap has disappeared, within the season of the midnight sun, the polar

caps can become the warmest spots on the surface of the planet. The temperature may rise to 65 or 70 degrees above zero Fahrenheit, Dr. Menzel stated.

He agreed with Dr. G. P. Kuiper of Yerkes Observatory that some simpler forms of vegetation, such as lichens, may be present on Mars. This form of life would account for the dark markings that change their color values with the Martian seasons. He also agreed with Dr. Kuiper in stating that animal life of types similar to those observed on the earth would be unlikely.

To account for the difference in the size of Mars when photographs are taken by blue and by red light, an effect first noted by Dr. William H. Wright of Lick Observatory, Dr. Menzel suggested a thin layer of fine carbon dioxide (dry ice) snow some 60 miles above the surface of the planet.

Science News Letter, September 30, 1950

GENETICS

Study of Genetics Aids Cancer Research

➤ THE science of genetics is helping in the search for causes and cures of cancer, even though heredity is at present a variable and uncertain factor in human cancer, Dr. Clarence Cook Little pointed out at the Golden Jubilee Celebration of the science of genetics in Columbus, Ohio. Dr. Little is director of the Jackson Memorial Laboratory, Bar Harbor, Me.

"Unbalanced growth tendencies introduced from different parental backgrounds may be a potent and basic factor in tumor formation," he said.

In most types of cancer, heredity may be involved, but its effects are complex and often indirect and unpredictable.

"In laboratory animals, however, where the force of heredity can be controlled, concentrated and analyzed, it is a powerful and important element in creating strains which are remarkably free from cancer or those in which its incidence is very high, generation after generation."

The use of genetics, he added, not only aids cancer research but has developed principles applicable in the whole field of experimental medicine.

"The hormones which affect the origin and progress of cancer growth," he said, "are to a large extent controlled in their degree of development of genetic influences."

Science News Letter, September 30, 1950

On This Week's Cover

➤ ARTIFICIAL suns six inches in diameter and comparable in temperature to the surface of the sun in the sky were demonstrated by Dr. Russel A. Miller, project supervisor of the high temperature research laboratory, in Philadelphia at the new Research Institute of Temple University.

Rods of aluminum, magnesium, and other metals are burned in small furnaces made of each metal's own product of combustion. Oxygen under pressure forms the atmosphere in which the six-foot metal rods are burned. Pools of melted metal, their surfaces covered with flames of burning metal vapors, are the "suns," as shown on this week's cover of SCIENCE NEWS LETTER, whose brilliance can be used to measure the temperatures inside the furnace. Materials are studied at the Institute at temperatures up to 7,000 degrees to learn how to make rocket engines and high-temperature turbines of more resistant materials.

Rotating furnaces are among the devices used to get the maximum heat from burning metals. These throw melted metal in thin sheets against the refractory sides of the combustion chamber, allowing it to combine faster with the oxygen supply.

Science News Letter, September 30, 1950

GENERAL SCIENCE

Defense Plan Out-Moded

The present plan for civilian defense seems designed for World War II rather than for World War III. The civilian defense group needs broader powers.

➤ "THE NEW federal plan for civil defense seems to me to be more like a plan for World War II than for World War III, a plan for TNT bombs rather than for A-bombs, so far as its administrative aspects are concerned," James M. Landis, civil defense director in the last war, told Science Service.

The new plan was sent to Congress by President Truman on Sept. 18. It declares that the real responsibility and authority in civil defense lie with state and local governments, that the proposed Federal Civil Defense Administration shall confine itself mostly to advice, research and coordination.

"There should be some ultimate source of command direction," Mr. Landis said, "and that source should be the federal government itself. I am afraid that the authors of this new plan do not realize how hard it is to get neighboring states to work together."

Mr. Landis pointed out that not only are there often political differences between states, but also in industrial states, many times, the governors and the mayors of the principal cities do not agree.

"The possibility of A-bomb attacks," he went on, "makes it much more necessary to set up overall command of civil defense resources and manpower. It is the extent of devastation which determines the amount of mobilization of resources necessary to meet the attack."

"A-bombing will require much interstate action. This new plan is adequate for the kind of bombing envisaged in World War II instead of World War III."

Mr. Landis said he believes the nation is going a little slow in its planning for civil defense. Even under the philosophy of this new plan, the states and cities are not moving fast enough, he declared.

"Congress should act during this session," he urged, "to establish an operational Civil Defense Administration with broader powers than those envisaged in the legislation suggested by President Truman."

Mr. Landis added that he does not think Congress will act until the next session convenes in January.

The former dean of the Harvard Law School who took over World War II's civil defense effort from the late Mayor Fiorello La Guardia said he hopes that the relations between the military and civilian aspects of defense against A-bombs will be carefully worked out.

"In World War II," he recalled, "some of the military in this country didn't want

to bother with civil defense. Their attitude seemed to be that the civilians could take care of themselves."

"Military air defense areas," he advised, "should be carefully coordinated with civil defense areas, and the mobility of military resources should correspond with the mobility of civil defense resources."

Science News Letter, September 30, 1950

AERONAUTICS

Instrument Carrier Drops From Seven-Mile Altitude

➤ INSTRUMENT-CARRYING aviation models are being dropped with relative safety from airplanes at altitudes of from 35,000 to 40,000 feet, it was revealed at Moffet Field, Calif., at the Ames Aeronautical Laboratory of the National Advisory Committee for Aeronautics.

These instrument carriers are unpowered bomb-like models that fall by gravity. In their drops from such heights they may acquire speeds slightly faster than that of

sound. The type used, with test wings, tails and control surfaces on a streamlined body, weigh upwards of 1,000 pounds.

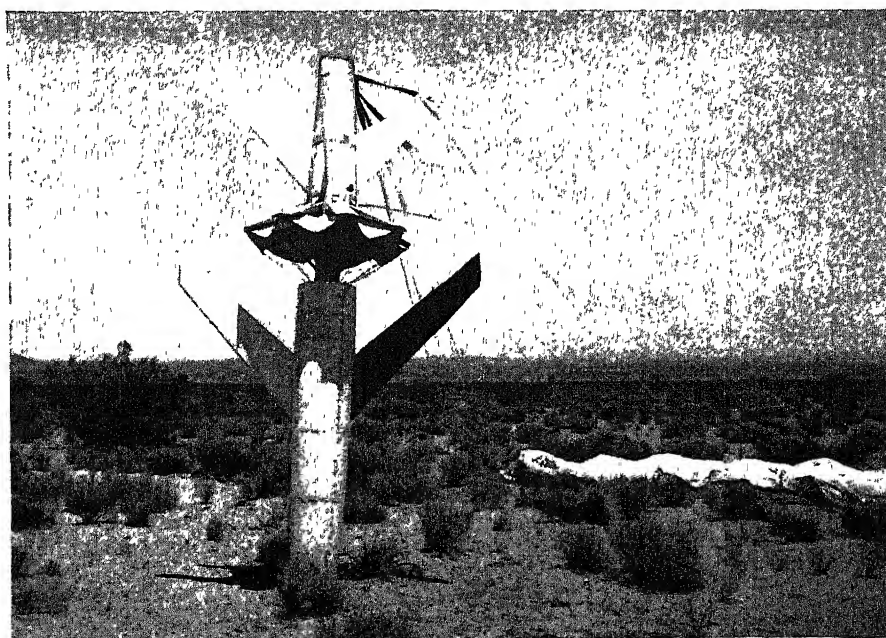
During the fall, engineers at ground stations determine the velocity of the falling body with optical and radar tracking units. Meanwhile, measurements of such factors as drag and lift on the body and the test wing, tail or control surface are being recorded on instruments inside the body.

The features that enable this falling carrier to hit the earth with little damage to itself and none to the instruments are dive brakes and a parachute. The dive brakes, strong umbrella-like devices, open at a predetermined point. The parachute is automatically released from a storage compartment in the tail when the speed of the body has been slowed by the brakes to a point where the parachute can be safely used.

The falling body program is one of several methods employed by scientists of the NACA to obtain more complete information on aerodynamic forces at transonic speeds near that of sound. The speed of sound is approximately 760 miles per hour at sea level. The falling body methods are in addition to work with wind tunnels.

In one of the methods, not using wind tunnels, small models are mounted on the wing of an airplane that goes into a speed dive during which the forces acting on the model are measured. A second method utilizes models mounted on rockets fired from the ground. A third utilizes the specially-built, rocket-powered Bell X-1 airplane and other jet engine planes.

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RECOVERY ASSURED—A free-falling body, after a drop of nearly seven miles, hits the earth. Its descent first checked by automatic dive brakes, shown open, and then by the parachute which is shown at the right, the body is buried nose first in the sandy soil of the California desert. The model wings are undamaged and the instruments and the records made during the fall are safe.

MEDICINE

Depth of Trance Measured In Hypnotized Person

➤ AN ELECTRICAL method for measuring the depth of trance in a hypnotized person is announced by Dr. Leonard J. Ravitz of Duke University School of Medicine in Durham, N.C.

The method is something like that of taking brain wave tracings, but brain waves do not show hypnotic trance depth. So electrodes are placed on the forehead and either hand of the person to be hypnotized, to measure voltage changes of the body.

During hypnosis, the tracing becomes more regular and electrical potential difference either gradually decreases or increases in magnitude. The voltage shifts dramatically at the end of the trance and the tracing becomes more normal.

The studies, made while Dr. Ravitz was at Yale University School of Medicine, are reported in the journal, *SCIENCE* (Sept. 22).

Science News Letter, September 30, 1950

INVENTION

Added Twinkles, Tinkles For Your Christmas Tree

➤ YOUR tinsel-decked Christmas tree will tinkle and twinkle with Yuletide joy if equipped with the latest addition to the age of gadgets.

U. S. patent 2,522,906 was issued to Leo R. Smith of Alexandria, Va., for a small vibrator designed to be attached to the trunk of a decorated evergreen tree. Plugged into the house circuit, the motor imparts a two-way shimmy which is imperceptible in the tree itself, the inventor says. But the tinsel and shining balls will thereupon dance and sparkle, and the tree itself will produce an "intriguing rustling sound."

Science News Letter, September 30, 1950

MEDICINE

Brighter Way to See Patient's Stomach

➤ DOCTORS will shortly be able to watch an image of what goes on inside a patient's stomach several hundred times brighter than the current fluoroscopic images. The new device, employing electronic methods and a fluorescent crystal, was developed by a University of Chicago physicist.

It will permit doctors to make routine or lengthy examinations for cancer and other diseases without fear of danger to the patient from too long exposure to X-rays and with a much clearer view of the patient's insides. Motion pictures of the image will also be possible with the new device.

Completion of the equipment, by Robert J. Moon, assistant professor of physics in

the university's Institute of Radiobiology and Biophysics, is reported in the university's RESEARCH REPORTS.

Mr. Moon points a television type electron gun at a target of tantalum foil. Some of the electrons, transformed into X-rays, are focused on the object to be X-rayed. After they pass through the object they hit a fluorescent crystal that changes the X-rays to ultraviolet rays. Their signal strength is multiplied many thousand fold and transmitted to a television-like viewing screen.

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GENERAL SCIENCE

M. I. T. Head Urges Total Draft if Total War

➤ ALL men of draft age should be drafted, if the emergency becomes worse. This is the opinion of President James R. Killian, Jr., of Massachusetts Institute of Technology. Once they are drafted, Dr. Killian said, they could be assigned to civilian as well as military duties.

Speaking at a banquet of the American Society of Mechanical Engineers, the M.I.T. President urged, however, that regardless of a general war, "a certain number of young men" should be required to continue their education in essential fields.

"Under such a complete draft," said Dr. Killian, "the problem becomes, not one of deferment, but one of where a man can best serve the country."

The educator urged that, in the present emergency, the educational programs should not be disrupted prematurely. Pointing out that the nation may be faced with either an international explosion or a series of Korean-like emergencies, Dr. Killian warned that, "if we prematurely disrupted or seriously curtailed our higher education, we could in the end wind up with a disastrous shortage of trained manpower which would weaken us for either contingency."

"You can't fight a modern war or maintain a modern peace without highly trained manpower," he went on. "You can't do either without first-rate scientists or engineers."

Science News Letter, September 30, 1950

AGRICULTURE

U. S. Cotton Takes Beating from Insects

➤ U. S. COTTON is taking the heaviest beating in many years from insects, the Agriculture Department reported.

Its monthly insect pest survey showed boll weevils, cotton leafworms, bollworms and pink bollworms were on a rampage. Texas and Oklahoma are at the center of the attack; in a regulated section of southern Texas, the pink bollworm has developed to serious proportions, the report said. In one county, losses in the field are running as high as 50%.

Science News Letter, September 30, 1950

DENTISTRY

Caries in Offspring Result Of Disease in Pregnancy?

➤ THE possibility that a baby may be born with a harelip or cleft palate or with unusual susceptibility to tooth decay as a result of his mother having an infectious disease during pregnancy will be investigated by Dr. Seymour J. Kreshover of the Medical College of Virginia at Richmond under a dental research grant of \$8,320 from the U. S. Public Health Service.

Gum inflammations and diseases, which are the chief cause of tooth loss in grown-ups, will be attacked in research aided by two other grants just announced. A method of measuring the prevalence of one major gum disease, gingivitis, and a study of the relation of alcoholism, diabetes and other chronic diseases to gum inflammation will be carried on by Dr. Isaac Schour of the University of Illinois under two grants totalling \$19,720.

The largest single grant, \$18,478, was awarded to Dr. J. R. Blaney of the University of Chicago to aid a 15-year study of water fluoridation as a means of fighting tooth decay.

The 28 dental research grants made on recommendation of the National Advisory Dental Research Council total \$187,076.

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ENGINEERING

Two Gallons Gas Equal To Three of 25 Years Ago

➤ TWO gallons of today's antiknock gasoline are worth as much in power as three gallons of the gasoline of 25 years ago which cost about the same per gallon disregarding taxes.

This claim was made in Detroit and backed up by road tests conducted by the Ethyl Corporation, using various automobiles, including a 1921 touring car, two 1950 models with experimental engines with low and high compression ratios and a couple of standard production 1949 models.

The 1921 model using fuel of 1925 vintage made 14.95 miles per gallon, the modern car with 4.5 to 1 compression ratio gave 16.08 miles per gallon on the same 1925 antiknock fuel, while the modern car with 8 to 1 compression ratio engine on 1950 premium gasoline gave 25.7 miles per gallon.

A test with the two current models with standard 7.5 to 1 ratio showed that today's gasolines and engines provide improved acceleration and hill climbing ability.

Science News Letter, September 30, 1950

E FIELDS

CHEMISTRY

Powdered Starch in Candy Factories Is Dangerous

➤ NEVER mind TNT factories. U.S. candy makers are in a pretty dangerous business themselves, explosion experts of the U.S. Bureau of Mines reported in Washington. They handle a ticklish raw material: powdered starch. When enough dust from the starch meets a source of ignition, said the Bureau's explosive researchers, there is apt to be a solid, resounding blast. "Explosion pressure relief vents should be provided in plants to reduce structural damage," the report says meaningfully.

Experiments in Pittsburgh laboratories of the Bureau of Mines are laying the groundwork for a safety code aimed at preventing dust explosions in the confectionery industry. One such severe starch-dust explosion occurred two years ago in a large candy factory. The safety code will be prepared under auspices of the National Fire Protective Association.

Science News Letter, September 30, 1950

NAVIGATION

Traffic Theories Can Keep Store Sale Crowds Moving

➤ THE PROBLEM of how to keep crowds moving to and from a bargain counter on a big sale day can be solved by using the same theories that apply to airport or railroad traffic control.

Proper navigation is a vital problem in war or peace. Dr. Paul Rosenberg, president of the Institute of Navigation, told the three-day joint meeting on Navigation and Electronics in New York.

"From pedestrian to canal barge, and from submarine to rocket," there are certain navigational problems common to all, Dr. Rosenberg stated. He urged that these common factors be integrated into a single, unified science. Heretofore, he said, scientists have been tied up with the intricacies of highly specialized fields, such as radar or loran.

"For example," Dr. Rosenberg stated, "a vacation tourist puzzling over an automobile road map in New England may present an amusing picture to a professional navigator, but the situation loses its humor when the selfsame type of navigational problem is encountered by a lost army patrol trying to find its way back to the U.N. lines in Korea."

Another example he cited was the importance of upper atmosphere and interplanetary navigation in the development today and tomorrow of long range rockets

and guided missiles.

Devices to guide blind persons now being tested use navigational methods and principles common to radar and sonar, Dr. Rosenberg stated.

Electronic navigation is "vital to all phases of military activity at sea, on land, and in the air," he concluded.

The meeting is sponsored by the Institute of Navigation, and two government-industry Radio Technical Commissions for the Marine Services and Aeronautics

Science News Letter, September 30, 1950

ENGINEERING

Sawdust Houses Stand Against Big Bad Wolf

➤ AND the big bad wolf said, "I'll huff and I'll puff and I'll blow your house in." But the lazy little pig—not the industrious pig who had built his house of brick—laughed and said: "Ha, ha, ha, I've built my house of sawdust, and you can't blow my house in."

Well, the big bad wolf thought this was exceedingly silly so he huffed and he puffed—but, try as he would, he could not blow in the lazy little pig's sawdust house.

You see, kiddies, the lazy little pig had built his house of high quality synthetic lumber made of pressed sawdust and wood shavings bonded with synthetic resin. Robert A. Caughey, research director of Souhegan Mills, Wilton, N.H., told the American Society of Mechanical Engineers meeting in Worcester, Mass., that this kind of lumber could be made of woods now considered either decidedly inferior or completely unusable. And, he said, it would cost much less. He declared that these synthetic boards often would do a better job than the real stuff now in use.

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INVENTION

Salt Removed from Ocean Water

➤ A CHEMICAL sleight of hand trick for removing salt and minerals from sea water was awarded patent 2,522,856. The inventor, Arthur M. Buswell of Urbana, Ill., has assigned all rights to the government, as represented by the Secretary of the Navy.

The new process produces drinkable water from the ocean. Most likely users: castaways on lifeboats or life rafts.

When a fresh water cask becomes empty it may be filled from the sea. About three-quarters of a pound of powdered silver fluosilicate is added per gallon of saltwater to remove the salt. When the solids have settled, the water is poured off into another cask, and about half an ounce of ordinary lime is added. After this settles, taking with it magnesium and the fluosilicates, the water is ready for drinking.

Science News Letter, September 30, 1950

ZOOLOGY-CHEMISTRY

No More Sugar for This Little Worm

➤ WESTERN sugar beet growers, who regard a tiny worm as one of their biggest pests, now have a new soil fumigant which may help them take a sizable amount of growing sugar back from this parasite.

The fumigant is a mixture of chlorinated hydrocarbons forced into the ground through nozzles, where the liquid vaporizes and kills most of the roundworms, or nematodes, in the vicinity. Northern Utah farmers who tried it last summer more than tripled their beet yield per acre, compared to unfumigated land.

The roundworms, an official of the Beet Sugar Development Foundation in Fort Collins, Colo. said, sometimes completely strip a badly-infested field of its crop. They are seemingly immune to ordinary insecticides, including DDT.

The new treatment is not permanent. It lasts only one year. It is so toxic, moreover, that it must be used at least two weeks before planting, or the fumigant will kill the sugar beets as well as the worms.

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AERONAUTICS

Join the Air Force To Sleep in Hammock

➤ FROM the days of wooden frigates to the six-engined might of the B-36, military life has turned full circle. The Air Force now is putting hammocks into its biggest bombers.

At Wright-Patterson Field in Dayton, the Air Materiel Command showed off an adjustable sleeping hammock made of nylon netting. A pair of the swinging bunks are to be installed in the forward flight compartment of each B-36 for use by standby crew members during rest periods.

Not that the B-36 doesn't have regular bunks. The giant plane has permanent sleeping facilities in a compartment near the tail. But it is a long crawl, inching on hands and knees through a tunnel cat-walk, for pilots, radio operators and flight engineers to reach the bedrooms to the rear.

The new hammocks are designed for catnaps up front, between hitches of flying during non-stop flights which last several days. They are a far cry from hammocks used in the day of iron men and wooden ships. These have adjustable support straps which mold the flexible netting to the body beneath the head, neck and knees. Tested by both Air Force and Navy personnel, the new swinging beds got top comfort rating.

Apparently the Air Materiel Command expects airmen to be hefty—or else it is merely preparing for the heftiest. The new hammocks are strong enough to hold 600

SAFETY

If Atom Bomb Hits

Getting victims to safety is the first rule in case of atomic attack. The time-honored first aid rules of yesterday have been modified.

By JANE STAFFORD

This is the first of a series of articles on the new first aid for atom bomb casualties.

➤ FOR defense against an atomic war, the nation needs 20,000,000 lay persons trained in first aid. And those 20,000,000 will need special training in new things to do to save atom bomb victims. Some of these things will be so modified as to seem almost the reverse of what you do normally in giving first aid to a highway accident victim or an injured workman in your plant.

You remember from the Red Cross first aid course you took during the last war that the first thing you were taught was to keep an injured person lying down.

"DON'T let an injured person get up. 'DO keep an injured person lying down,'" read the instructions in the American Red Cross First Aid Textbook, with pictures to emphasize this important lesson.

Reversal in Rules

But if you are going to give first aid to victims of an A or H bomb, you may not always be able to follow these time-honored directions. Your first job may be to get the injured person to safety, regardless of whether he is fainting or has broken bones. If fire is creeping close, if the walls of nearby buildings are about to fall, and if you are alone with half a dozen badly injured persons, you will not be able to "splint them where they lie."

In case of an atom bomb explosion it may be that the most life-saving thing you can do will be to rescue the injured from areas of hazard. It may be possible to give topnotch first aid care to many victims and this should be done wherever possible. But where there are many cases of badly injured and equipment is lacking, many of your carefully learned first aid lessons may need to be changed.

In the first aid course, for example, you learned to be careful about every minor cut and scratch, cleansing them thoroughly and perhaps applying a sterile dressing to guard against infection. In the event of an atom bomb attack, some of your patients may be covered with tiny cuts and scratches from flying glass. But in a critical situation, you will pay no attention to these, and if that is all the injury the person has, you will send him on his way home or to shelter, telling him to see his doctor a few days later when things have quieted down. The reason: There will be too many seriously injured needing your care.

You learned in the Red Cross first aid class to see what injuries the patient had and to care for the most serious ones first. You will be doing the same thing in case of an atom bomb attack, but on a much larger scale and with one important new feature added.

Geography in First Aid

This new feature may well be included in the first lesson you will get in first aid courses revised and expanded to meet the needs of atomic war. This first lesson may be on the geography of an atom bomb attack as it relates to first aid to the injured. Through it you will learn to think of your home town in terms of circles or concentric rings, like the rings that spread out from the center when you drop a stone in a quiet pool of water.

At the center is the point where the bomb drops, if it is an air burst. What you do in the way of first aid depends on where you are in relation to this central point. Up to one mile out, in all directions, from this central point, will be the area of very heavy destruction from the blast damage

and of deadly dosage of radiation. Most of the people in this area will be killed, but a few will survive. Authorities estimate that about 5% of people in this first zone will survive and not even suffer damage from radiation. The figures are based on the Japanese experience. Survival of these few people was due to the fact that they happened to be in places where they were sheltered both from blast and radiation.

Modified Aid in Second Circle

For the next mile out in all directions there will be heavy blast damage and this is also the "dangerous dose" area of radiation. Here is where you will apply your modified first aid. This is the hazard area where there may be fire, falling walls and flying debris that could kill you and your patient while you are taking time to apply a splint or a tourniquet to stop bleeding.

Here also is the place where you probably will not have any splints or tourniquets or sterile dressings to apply even if you had the time. They will either have been destroyed or so covered with debris that you could not get at them. So you look first, as always, for signs of shock and bleeding, but also for signs of approaching fire or shaky walls.

If the patient is bleeding profusely, you put your hand right over the bleeding place and press hard enough to check the bleeding. You keep up the pressure while you lead the man or woman to safety. More likely, you will have to show the patient where and how to use pressure



MASS INJURY—In case of an atom bomb attack on your city, the scene from a Reno, Nev. fire in which more than 180 persons were so badly hurt they had to be sent to hospitals may be repeated hundreds of times every few blocks throughout the city.

and send him on his way while you go on to care for the next victim, and the next, and the next.

You may notice the symptoms of on-coming shock as you have been trained to do, but whether you have the patient lie down and try to keep him warm, to prevent shock, or whether you send him on to a safer area or to his home will depend on the situation with regard to the likelihood of further damage and injury.

You do not need to worry or even think about the radiation effects. Up to the present, there is nothing in the way of first aid treatment that will overcome the effects of a heavy dose of radiation. All the things that can be done, including the new methods now being tested in laboratories, for helping toward the possible recovery of patients who got heavy doses of radiation, will have to be done by doctors and nurses. Your role as a first aider will be to keep the surviving victims from bleeding to death or getting further fatal injuries before the doctors and nurses have a chance to try to treat the radiation effects.

Running Away Useless

Remember this about the radiation from an atom bomb: It is all over in a minute or so. About 99% of the radiation produced comes out in the first fraction of a second after the bomb goes off. By the time you have picked yourself up, realized what has happened and pulled yourself together and begun to think about using your first aid training to help those around you, the worst is over. You will gain nothing by running away. You can safely stay and help those who need help.

Next in the geography of atom bomb first aid are the areas between two and four miles out from the center where the bomb was dropped. Here the damage will be moderate to slight. Most buildings will be standing, there will not be much fire danger, but there may be many casualties.

Place for Top First-Aid

About 20% or 25% of the people in these two outer areas of a mile each will be killed. Many others will have severe injuries. There may be bad leg cuts that are bleeding profusely. Quick, proper treatment can save many lives here. And this is the area where topnotch first aid can and should be given.

You will have time to do it because there will not be so many injured in your immediate vicinity, and you will have splints and other equipment to use. But even though you may see only two or three or five badly injured persons, the total number will be large because the area is circular. So the total number of trained first aiders must be large if people in this area are to be saved.

You will not, of course, stop to consult a map to see which area you are in after an atom bomb burst. Nor will you be able

to tell the exact point where the bomb fell. But if most of the buildings are down and you see fire, you are near the central area.

If only a few buildings are down, and those mostly the small brick structures, you are probably out in the moderate to light damage areas. The one-, two-, three-, and four-mile circles may each be larger, depending on the power of the atom bomb dropped.

Science News Letter, September 30, 1950

BOTANY

Explorers to Visit South American "Lost World"

➤ AN EXPEDITION to the "lost world" of South America, one of the world's least explored areas, is being organized by the New York Botanical Garden and its Venezuelan associates to study some of science's most interesting plants.

Penetrating into the most remote part of Venezuela where high sandstone mountains create an isolated region, three American botanists and their Venezuelan colleagues will be gone about half a year. Organized by Dr. William J. Robbins, director of the New York Botanical Garden, the expedition party will consist of Basnett Maguire, curator, John Wurdack and Richard Cowan, botanical assistants.

Explorations will be concentrated in the Orinoco headwaters and they will visit particularly Haumacari and Yacapana, two of the sandstone plateaus. Neither has been explored botanically and, as far as is known, the first has never been scaled.

Instead of taking dollars to pay the Indians of the region for their aid, trade goods of use to them are being carried by the scientists. Among the articles desired by the Indians are quantities of lipstick, which they use to decorate their faces and bodies.

The Venezuelan mountains were the setting of Doyle's fanciful story of the Lost World.

The New York Botanical Garden already has a major botanical collection of the region.

Science News Letter, September 30, 1950

Encyclopedia of

ATOMIC ENERGY

by Frank Gaynor

A comprehensive collection of brief explanations and definitions of concepts and terms in the field of Nuclear Physics, Atomic Energy, the H-Bomb. "A must for every physicist as well as every intelligent layman interested in atomic science."—Dr. Sydney N. Baruch, Consulting Engineer, Special Weapons Division, U. S. Air Forces; Inventor of the anti-submarine depth bomb. Illustrated \$7.50

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AERONAUTICS

Electric Ovens Provide Hot Food for Combat Crews

➤ IMPROVED electric ovens for giant bombers and troop carriers on long flights have been developed in Dayton, Ohio, at the Wright-Patterson Air Force Base. They will provide the means of supplying hot food to the largest crews even during a round-the-world non-stop trip.

The heaters are of different designs and different sizes. Bombers such as the B-29 and B-50 will be equipped with two ovens designated as the B-3, which can heat eight cans of a special complete ration in 11 minutes.

It is an oven with two shelves, and is heated with 400-watt and 120-watt units. Heat is regulated by thermostatic controls to prevent temperatures higher than that of boiling water, thus keeping the cans from exploding.

For troop-carrying planes, larger heaters are available. Some will heat 48 cans of rations in 35 minutes. Another oven is designed particularly for frozen foods. It can heat six frozen meals in 35 minutes, and has removable shelves so it can be used for canned rations.

Along with the development of these ovens, new types of canned rations have been developed. These tasty pre-cooked canned meals, known as IF-2 rations, contain such foods as boned chicken, beef and pork loaf, ground meat and spaghetti. They contain also fruit, crackers, cookies, and candy for dessert. The frozen dinners contain meat, potatoes and a green vegetable, all wrapped in expendable aluminum trays.

Science News Letter, September 30, 1950



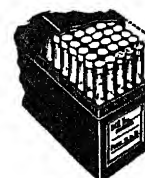
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MINING

Uranium Mining, Milling

➤ URANIUM mining for the essential atomic energy mineral is private business in the United States

Under the policy of the U.S. Atomic Energy Commission the job of finding, mining and processing uranium ores is left to the mining industry, the American Mining Congress was told in Salt Lake City.

The government is the only buyer. It fixes the ore-buying price. Prices are fixed to encourage prospecting and mining. The Commission is helping the industry by making geological surveys, by furnishing free testing and assaying service and, more important, by guaranteeing a market for the uranium ores.

The domestic uranium policy of the Atomic Energy Commission was explained by Jesse C. Johnson of the Commission. When the policy was first announced two years ago, there were only 15 individual uranium mining operations employing a total of 55 men, he said. Today there are over 200 different mining operations with total employment in excess of 1,000, and production is at an all-time high.

This increase in production has been achieved without government financing of private operations. All the ore is produced from privately-owned mines and over 80% is processed in privately-owned plants.

This indicates, he declared, that uranium mining can be a profitable business. It indicates also that the prices paid are sufficiently attractive to induce mining companies to develop and operate mines and construct uranium milling plants.

Uranium milling, introduced in 1942 and now boasting six mills, is destined to play an important role in the field of mining and milling.

The American Mining Congress was given a review of uranium production by F. W. McQuiston, Jr., of the U.S. Atomic Energy Commission. Uranium is widely distributed in the rocks of the earth's crust, he said, but it occurs sparingly as high-grade ore deposits. It is more plentiful than gold and silver, and almost as plentiful as lead and zinc.

The six mills now operating are in Colorado and Utah. One other is under construction and two more are planned for the near future. First important operations were the leaching of accumulated piles of tailings from milling vanadium ores in Colorado. It is definitely indicated, he declared, that in the near future several million tons per year of low-grade materials will be milled for the recovery of uranium.

Canadian and other foreign operations are producing uranium. The largest milling operations on which information is available are those at the Shinkelowbe mine,

Belgian Congo, Eldorado mines, Great Bear Lake, Canada; and on the Colorado plateau in Colorado and Utah. Gold production in South Africa, oil shale in Sweden and marine phosphate deposits in the United States offer potential by-product uranium production.

Of the great variety of uranium occurrences, pitchblende ores have been by far the most productive. Uraninite, another primary mineral, has considerable economic importance. Certain secondary minerals have also contributed to uranium production.

Science News Letter, September 30, 1950

INVENTION

Steam-Heated Chair For Winter Comfort

➤ STEAM-HEATED chairs, to give comfort to persons in a theater or auditorium, may also be used for cooling in summer by circulating cold water through the pipes that carry steam or hot water in the winter. This "temperature-controlled seat" was awarded a patent by the government recently.

The support that holds the seat is a pipe to carry steam, hot water or cold water. The seats, including the backs, are made of endless metal straps. Being metal, they are conductors of heat. Since the straps are attached to the pipes that carry the hot or cold liquid, they pass the temperatures on to the users.

The inventor is Eric G. Pophal, St. Paul, N. C. Patent 2,521,091 was awarded to him.

Science News Letter, September 30, 1950

GENERAL SCIENCE

Nursing Students Ignorant of Sex Matters

➤ NURSING students are "abysmally ignorant" on matters of sex, Drs. Albert Ellis and Earl W. Fuller found from study of questions asked by third-year students at the New Jersey State Hospital, Greystone Park, N. J.

The questions were raised at round table discussions held by the director of the Mental Hygiene Clinic. They were dropped anonymously in a closed question box. The girls were free to bring up any problems, particularly those they would hesitate to discuss with parents or teachers.

A total of 1,908 questions were asked by over 2,000 students. It was found that 39% were concerned with love, marriage and family affairs, 31% with specific sexual topics, and only 30% with non-marital, non-sexual topics.

The most naive questions were asked by these girls regarding sex, revealing their lack of sexual education not only at home and in school, but in their nursing training.

Even though the girls were preparing for nursing, a career notable for its high percentage of unmarried women, they were particularly concerned with all aspects of marriage, from dating and falling in love to the bringing up of children.

Dr. Ellis and Fuller compared the questions asked by these nursing students to questions asked by American soldiers in sex talks reported by Dr. Fred Brown of Mount Sinai Hospital, New York.

The girls were more concerned than the soldiers about pre-marital and extra-marital intercourse, birth control, petting and sex education. The soldiers were more interested than were the girls in abstinence, sex "perversions," menstruation, pregnancy and abortion.

Some of the questions asked by the nursing students:

What is love? Can there be love at first sight? What do you think of blind dates? What is the ideal length of time for an engagement? What is your opinion of trial marriage? How far should a girl go in petting? What is sex? Should a girl be ashamed to undress in front of other nurses?

Science News Letter, September 30, 1950

AERONAUTICS

Rear-Facing Plane Seats For Greater Safety

➤ A FORWARD step toward the adoption of rear-facing seats in airplanes was revealed in Dayton, Ohio, at the Wright-Patterson Air Force Base. It is the development of a strong, light-weight aft-facing seat that can withstand forces almost three times as great as its front-facing predecessors.

Rear-facing seats in airplanes have long been advocated by airplane safety engineers. The backs and headrests provide a far greater degree of support in case of a crash landing than the present straps around the front of the body. Tests made show that the human body can withstand very high forces when sitting in the backward-facing seats.

Light weight in these new seats is obtained by the use of aluminum sheet, replacing the customary steel tubing. Foam rubber is used for padding. Plastic seat covers are used over the foam rubber. This plastic, already in use in automobiles, is a long-wearing type, resistant to moths, mildew, fungus and fire.

The new seats were developed by the Aero Medical and Aircraft Laboratories at the Air Force Base in Dayton. Beech Aircraft Corporation will build the seats. The first large installations will be in 20 C-54s used to carry soldiers by the Military Air Transport Service.

Science News Letter, September 30, 1950

ENTOMOLOGY

**Mosquitoes, Young or Old,
Use Tactics of Modern War**

➤ BABY mosquitoes crash dive for the bottom when startled by shadows or electrical impulses. Adult mosquitoes, out on an air raid with blood in their eye, fly at different altitudes, according to their type.

These two bits of information are offered by scientists on opposite sides of the world. It seems man has nothing on the mosquito in practicing the tricks of modern warfare.

Studies on the "crash dives" that mosquito larvae use as their sole means of defense are reported by an Australian zoologist, Dr. I. M. Thomas of the University of Adelaide, in the *Australian Journal of Scientific Research* (Feb.).

Dr. Thomas found he could startle the baby mosquitoes into diving by turning lights off and on or by sending a mild electric shock through the experiment tanks—but only for a while. After the process had been repeated a number of times, the larvae apparently said, "Nuts, there isn't any wolf!" At any rate, they stopped diving.

In the savanna country of eastern Colombia, Dr. Julian de Zulueta reports in the British journal, *Nature* (July 29), mosquitoes of different species fly at different heights above the grass-tops while searching for animal blood.

The jungle mosquitoes do not like to cross areas cleared of grass, however, it was found by the researcher of Colombia's Ministry of Hygiene. Donkeys staked out in a clearing attracted far fewer mosquitoes than if tethered out in the savanna.

Science News Letter, September 30, 1950

PSYCHIATRY

**Organization to Work for
People's Peace of Mind**

➤ GREATER peace of mind for people throughout this nation and the world is the hope of a new organization formed in New York.

The organization is the National Association for Mental Health, Inc. It aims to "promote the welfare of mankind" by working for more adequate care and treatment of the mentally ill and mentally retarded, improvement and expansion of training programs for psychiatric and allied professions, stimulation of research and dissemination of information to the public about mental health and ways to preserve it.

The new association was formed by a merger of three voluntary organizations in the mental health field: the National Committee for Mental Hygiene founded in 1909 by Clifford Beers, author of *A Mind That Found Itself*; the National Mental Health Foundation; and the Psychiatric Foundation.

Staff members of the three organizations will comprise the staff of the new association. President is Oren Root of New York, and medical director is Dr. George S. Stevenson, for many years medical director of the National Committee for Mental Hygiene.

Science News Letter, September 30, 1950

OCEANOGRAPHY

**Anchovies off West Coast
Are Sardine Supplement**

➤ ANCHOVIES off the Pacific Coast may supplement the commercial sardine catch. A "census" of these silvery, greenish-backed fish has been completed in La Jolla, Calif., as a first step toward that possibility.

The survey was made by Dr. J. L. McHugh, assistant marine biologist of the University of California's Scripps Institution of Oceanography.

He found that at least three types of anchovies inhabit the open ocean waters of the Pacific Coast and at least two types make their homes in the sheltered bays.

One type of ocean-going anchovy is found from British Columbia to Monterey, Calif., a second type from Monterey to Cedros Island in Lower California; and a third type from Cedros Island to the southern tip of Lower California.

Science News Letter, September 30, 1950

PHYSICS

**Shimmer Affects Spotting
Dark Objects on Horizon**

➤ THE VISIBILITY of a dark object seen against the horizon is affected not only by the scattering of light by the atmosphere, but by "shimmer" or "optical haze."

A method of measuring this "shimmer," so important to military operations, is reported in the *JOURNAL OF THE OPTICAL SOCIETY OF AMERICA* (Aug.) by Drs. Howard S. Coleman and Harold E. Rosenberger of the University of Texas in Austin, Tex.

Shimmer is due to small scale convection currents that cause small air masses of different optical density to cross the line of sight. Momentarily, the light from the background is directed along the line of sight and the light from the object under observation is directed elsewhere. The net result of this is a lessening of apparent contrast when a dark object is viewed against a bright background such as the sky or the horizon. In the case of a bright object viewed against a dark ground, there is no change in contrast.

The size of the object has a lot to do with the effect of optical haze on visibility. The nearer the size of the image of the object approaches the size of the entrance pupil to the photosensitive receptor used to "see" it, the more shimmer will diminish contrast.

Science News Letter, September 30, 1950

IMPORTANT: Even if you've never had formal scientific schooling, you can achieve a grasp of

**EINSTEIN
AND MODERN SCIENCE**

that is possessed by few persons not engaged in advanced physics!

At last you can obtain a thorough, professional understanding of Relativity Theory, Expanding Space, Non-Euclidean Geometry, The Scientific Method, and the revolutionary ideas of modern physical theory. When you have finished reading our just-published second revised edition of A. d'Abro's *EVOLUTION OF SCIENTIFIC THOUGHT FROM NEWTON TO EINSTEIN*, you'll know more about these concepts than almost anybody outside the field of advanced physics or mathematics—and we'll prove this statement, or your money will be promptly refunded!

No unexplained mathematics beyond that taught in high school is used. All technical terms are clearly defined and demonstrated. Yet this book is in no way comparable to ordinary superficial and over-simplified works designed for the use of the layman. As R. L. Bent of Rochester, N. Y., wrote in an unsolicited letter: "It is one of the few books on relativity which adopt non-mathematical methods of explanation, and yet retain accuracy and precision of statement."

An Intellectual Adventure

Reading this 481-page book is a profound intellectual adventure—one that you'll profit by so long as you retain an interest in science. You will learn how Newton's discovery that mathematics could be used as a tool of scientific investigation multiplied our power of thought in much the same way that Archimedes' lever multiplied physical power, how Riemann showed that three-dimensional "common sense" space was not necessarily the only one possible; how Maxwell formulated a theory of electro-magnetism that resulted in a host of electrical inventions that we use today; how Einstein's special and general theories of relativity were founded logically on nineteenth-century scientific thought. You will learn about the important and interesting theories and experimental work of Mach, Weyl, Eddington, Poincaré, Gauss, Helsenberg, et al. You'll find out about continuums, gravity, tensors, laws of motion, irreversibility of time, the discovery of space-time and hundreds of other fascinating related subjects. Typical comments: "The clearest account of special and general relativity I have ever read"—Professor Edward Kasner, Columbia University. "A model of semi-popular exposition"—*New Republic*.

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WILDLIFE

NATURE
RAMBLINGS

Raccoon

➤ A CHUBBY little bandit with the brain and dexterity of a second-story man no longer furnishes college sophomores with the touchstone of campus success, but the raccoon is the reason why many youngsters think Daddy was awfully fat while still a member of the Class of '28. In those days there was many an athlete who was a lithe demon on the gridiron and a Bacchus, at least in bodily outline, off it. So much for the effects of the coonskin coat.

Raccoons are relatively primitive animals in zoology's family tree, although they more than live up to the black burglar's mask Nature gave them. Like the hands of monkeys and men, the raccoon's paws are unspecialized: they can be used for a variety of purposes, and usually are. They can unlatch chicken coop gates, husk sweet corn, break open a mussel shell or solve the special marauder-proof lid of a garbage can. In zoos, raccoons have nearly the pulling power of the monkey house. They handle things incessantly, and in addition splash around fondly in the monkey's bane and horror—water.

It is not true, however, that raccoons instinctively wash everything before eating it. If a crayfish is covered with mud, back into the stream with it for a quick rinse. If an earthworm looks dry and wrinkled, let it soak for a time. The raccoon washes for a reason: despite his fabulous appetite, he cannot be accused of drooling over his food, for his mouth is poorly equipped with saliva glands. He uses water to help him soften dry, harsh items on his menu. Give him a tree full of red-ripe cherries, or a fine fat frog, and there will be no time lost in needless scrubbing.

With mice, earthworms, birds, fruit, milk corn, frogs, fish, insects, turtle eggs, shellfish and clams on his diet the coon is no lank and stringy specimen. He spends most of his waking hours gorging himself, sleeps off the lethargy of an over-stuffed stomach, then begins another feast. The result is a well-rounded contour which makes raccoon a choice item at sportsmen's dinners, and lets him sleep away long

winter weeks without so much as an acorn stored in his hollow tree.

When treed by dogs or backed into a tight spot with his family, however, the roly-poly raccoon is a fierce and reckless fighter. Any hound that lives to an old age after a life of coon-hunting will be covered with scars from slashing paws he could not dodge.

Wary old raccoons resort to many tricks to befuddle dogs hard on their heels. Instances are reported where a coon will lead a dog into a stream, jump on the dog's head from the bank, and thereupon ruthlessly drown the pursuer.

Science News Letter, September 30, 1950

ENGINEERING

Reflecting Aluminum
Cools and Heats House

➤ BY LIVING within rooms that are covered, ceiling, walls and floor, with heat-reflecting aluminum foil, Dr. and Mrs. Clarence A. Mills, are able to keep cool in summer and warm in winter without conventional heating or air-conditioning, insulation or weatherstripping.

In the experimental residence named Reflection Point now open for inspection in Cincinnati, the University of Cincinnati authority on climate has applied reflective radiant conditioning so thoroughly that no attempt is made to heat, cool or change the moisture content of the outside air admitted summer or winter.

Around the top of the walls is an aluminum trough containing cooling coils for summer use and electric heating elements for winter. Figured aluminum foil on walls and ceiling, and similar foil atop the concrete floor slab covered with foam rubber and nylon carpet, reflect the heat in winter to the bodies of people in the room. The occupants are comfortable regardless of the room's temperature. In summer the process is reversed.

The system is turned off and on like lighting by a wall switch, and it is used only when a room is occupied. Unheated air from the outside is filtered electrostatically to remove dirt and dust. Sufficient indoor pressure is created to give an outward draft through all cracks and openings through which dust might enter.

Operating costs can be reduced by the system, Dr. Mills reports. With a 96-degree exterior heat, the reported cost of cooling persons in all seven rooms was two kilowatts an hour for actual operating times or roughly 25 cents per ten-hour operating day.

The system can be applied to old buildings as well as new construction, it is claimed. The principles are also being investigated for use in hotels, high-speed jet-propelled airplanes, army tanks, ships, temporary housing in polar cold and tropical heat, farms and even in clothing.

Science News Letter, September 30, 1950

AGRICULTURE

Young Forests Given
Help by Weed-Killers

➤ WEED-KILLING chemicals used widely on farms and gardens are being tested as a possible aid in making young forests grow.

When a forest burns, replacing it is more than a matter of simply planting seedlings. Underbrush, weeds and scrub trees with little value but prodigious powers of survival move in and choke the desired trees, robbing them of sunlight and moisture from the soil.

Working on the notion that seedlings might take firmer foothold on land wiped clean by chemical poisons, scientists at a U. S. Forest Service experiment station at Upper Darby, Pa., began decimating test plots in the Allegheny National Forest with weed-killers.

The chemical ammonium sulfamate, better known to home gardeners under the trade-name Ammate, proved effective. Sprayed on at the rate of 435 gallons per acre, it killed all vegetation on the treated plots. Two years later, the plots were still fairly open. Test trees planted after the first year in the poisoned soil apparently were not affected, however. They were free to grow straight and tall.

There is one small hitch to the new technique for preparing planting sites, the scientists admitted. At present, the most successful ammate treatment would cost about \$50 an acre. In a burned-over area of thousands of acres, the bill for helping a new forest along apparently would give pause even to the U.S. government.

Science News Letter, September 30, 1950

AERONAUTICS

Doubling Navigator's Work
With More Space, Equipment

➤ IF airplane navigators on flights in the middle latitudes were given proper equipment and workplaces, they could do not only their own work but that of an additional crew member. Psychologist Julien M. Christensen, Wright-Patterson Air Force Base, reported his conclusion, based on a study of 12 navigators during some 120 hours of flight, to the meeting of the American Psychological Association in State College, Pa.

The present arctic navigational crew could be reduced from two or three men to one. The arctic navigator spends 34% of his active time on paper work, Mr. Christensen found. Less than half his time is spent on instruments. The navigator in the middle latitudes spends an even greater proportion of his time (46%) on paper work.

Techniques such as log work and celestial solutions must be made more efficient if they are to work in modern high speed aircraft, Mr. Christensen concluded.

Science News Letter, September 30, 1950

Books of the Week

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ELECTRICITY IN THE HOME AND ON THE FARM—Forrest B. Wright—Wiley, 3rd ed., 280 p., illus., \$3.96. For those who wish to gain a practical knowledge of electricity and its applications.

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THE FIRST BOOK OF STONES—M. B. Cormack—Watts, 93 p., illus., \$1.50. If your child collects stones, this book will help him to grasp the significance of the variety. Well illustrated by M. K. Scott.

FOREST PRODUCTS: The Harvesting, Processing, and Marketing of Materials Other Than Lumber, Including the Principal Derivatives, Extractives, and Incidental Products in the United States and Canada—Nelson C. Brown—Wiley, 399 p., illus., \$5.00.

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THE PURSUIT OF PLINY: The Story of Man's Expanding Domain—A. G. Mezerik—Harper, 209 p., \$2.50. The abundance of natural resources and a blueprint for their attainment is presented.

RECONSTRUCTION IN PHILOSOPHY—John Dewey—New American Library, 168 p., paper, 35 cents. A mentor book originally published by Beacon Press. Some of Dewey's theories on experience and reason, the scientific factor and moral reconstruction are presented.

UNITED STATES CIVIL DEFENSE—National Security Resources Board—Gov't. Printing Office, 162 p., illus., paper, 25 cents. A plan for organizing the civil defense of this country. (See SNL, Sept. 30, 1950, p. 215).

WHITE-FRINGED BEETLES AND HOW TO COMBAT THEM—H. C. Young and others—Gov't. Printing Office, U. S. Dept. of Ag. Circ. No. 850, 15 p., illus., paper, 10 cents.

Science News Letter, September 30, 1950

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⚙️ **DETACHABLE UPPERS** in various styles and colors are used with a single sole-heel section in a shoe just patented. Slots in the upper side of the sole, extending rearward from the cut-off toe, hold special edges of the uppers which are slid into them at the open front.

Science News Letter, September 30, 1950

⚙️ **INDUCTION HEATER** to loosen tight-fitting fixtures on a power shaft such as pinions or gear wheels, is a small-size electrical device, rapid and effective because it distributes the heat evenly throughout the interior of the pinion. Little heat reaches the shaft to affect it.

Science News Letter, September 30, 1950

⚙️ **LIGHT CONCENTRATOR**, an improved light-weight lens and spring wire clip device, is quickly attached to an electric lamp bulb and gives a four-inch spot of illumination at a distance of 12 inches from the bulb. Its feature is the new type of lens used.

Science News Letter, September 30, 1950

⚙️ **TWINE HOLDER**, shown in the picture, is a plastic sphere molded in two halves which can be separated to insert the twine ball. Its feature is a razor blade



in a special holder on one side with a small portion of the blade exposed in a recess where the string is cut.

Science News Letter, September 30, 1950

⚙️ **COIN DETECTOR**, for use in offices receiving many letters containing nickels and dimes, is a machine which screens

opened mail to see that no coins have escaped the envelope openers. A coin-bearing envelope passing an electrostatic field in the machine is kicked aside.

Science News Letter, September 30, 1950

⚙️ **HYDRAULIC ARCH SUPPORT**, to be worn in the shoe, is an insole of two pieces of thin leather between which is a flat elastic bag containing a low-viscosity fluid. With each step, the pressure of the heel forces forward the fluid in the bag, making it take the shape of the arch and support it.

Science News Letter, September 30, 1950

⚙️ **STAMP COLLECTOR'S AID** with an attached magnifying glass can be used to measure sizes, count perforations and check watermarks. It is a compact plastic instrument with measuring scales under the lens, and a rotatable cylinder with different stamp perforation scales.

Science News Letter, September 30, 1950

⚙️ **CHILD'S DRESS** has built-in panties lined with a moisture-resistant plastic film. It is designed with snap fasteners down the front of the dress and along the sides of the panties so that it opens flat for simple dressing and undressing.

Science News Letter, September 30, 1950

Do You Know?

The average weight of *beef* animals when slaughtered is about 1,000 pounds.

Mayonnaise, for interstate shipment in the United States, must be 65% vegetable oil.

Eggs should be kept in the refrigerator; they lose freshness rapidly at room temperatures.

Bark from lumbering operations makes an excellent litter in poultry houses if reduced to a ground form.

Methylene chloride is used in some paint removers, being regarded as one of the most rapid solvents for paint, varnish and lacquer.

Sulfuric acid is often called the most important industrial acid; during 1949 over 10 million tons of it were produced in the United States.

It is estimated that over 41,000,000 household *electrical appliances*, from refrigerators to clocks to toasters and fans, will be sold in the United States during 1950.

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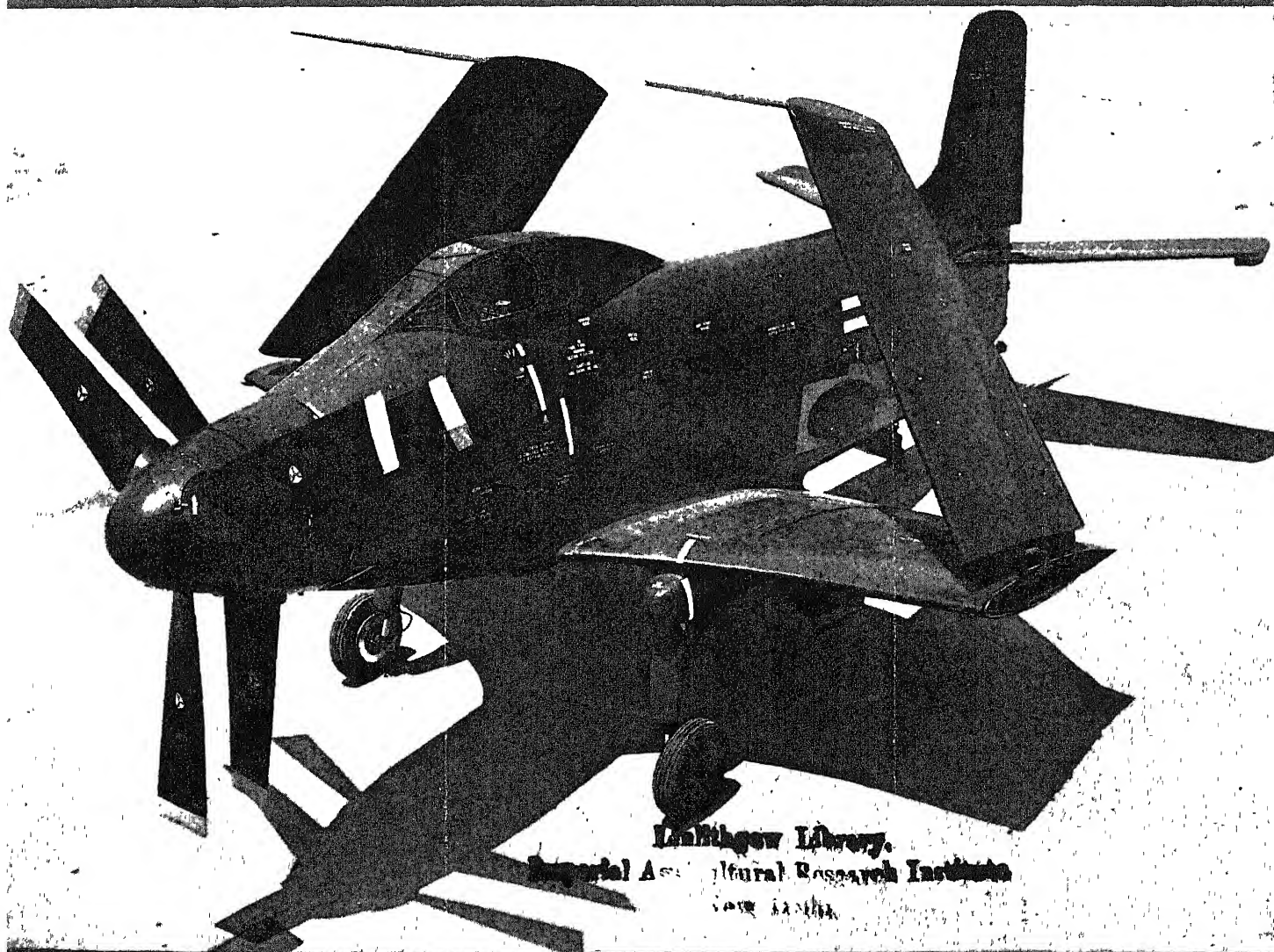
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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



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See Page 235

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VOL. 58 NO. 15 PAGES 235-249

Cold Enough to Freeze... the Resistance Out of Metals



When temperatures drop low enough... say 450 degrees below zero... bouncing molecules come to a virtual standstill, eliminating resistance to the flow of electricity so that current will flow indefinitely—even after the power supply has been cut off.

The illustration shows this phenomenon being demonstrated. A circuit has been submerged in liquid helium at a temperature of 452 degrees below zero. The demonstrator... Dr. Aaron Wexler... has “pulled the plug”, disconnecting the circuit. The needle on the upper scale reads zero—no current is entering the circuit.

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shows that 7,000 amperes are flowing through a cylinder of niobium.

So we have a phenomenon... one of the dividends from pure research that is constantly under way with Westinghouse. This particular result of research may lead, for example, to new and better methods of electric power transmission, to mention only one possible application.

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MEDICINE

Pneumonic Plague Danger

There exists a danger now of an outbreak of pneumonic plague unless it is spotted and treated early. Gland diseases of the groin or armpit regions are indicators.

► DOCTORS in 15 western states should suspect plague in any case of disease in the lymph glands of the groin or armpit regions, Dr. Vernon B. Link of the U. S. Public Health Service's western communicable disease center at San Francisco, warns in the *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* in Chicago (Sept. 30).

He foresees danger of an outbreak of pneumonic plague with serious loss of life unless plague is suspected, diagnosed and treated early.

Penicillin, famous mold remedy effective in many diseases, "has no value whatsoever in the treatment of human plague," Dr. Link also warns.

In two recent cases in which penicillin was the only drug given, the patients both died, he reports.

Streptomycin and sulfadiazine are the treatment of choice and should be started immediately "even when only a possibility exists that the disease is plague," he states. In one case, he reports, the use of these two drugs "produced an immediate, dramatic, life-saving effect in a moribund patient who most certainly would have died without such treatment."

The 15 western states in which plague danger exists for humans are. California, Oregon, Montana, Idaho, Nevada, Utah, Wyoming, Washington, Arizona, New Mexico, Colorado, North Dakota, Oklahoma, Kansas and Texas. Plague infected rodents, such as rats and ground squirrels have been found in all these states, constituting a reservoir of infection that may spread to man.

From July, 1949, through July, 1950, five cases of plague and 13 more suspected cases have occurred. This figure is considerably above previous averages and is one reason for Dr. Link's warning. Another reason is that two of the five cases occurred in counties of New Mexico in which wild rodent plague had never been found before.

Plague cases at present are sporadic and are of the bubonic type. But Dr. Link warns that a case of pneumonic plague might develop at any time and could give rise to a serious outbreak because this kind of plague spreads directly from person to person and therefore is much harder to control than bubonic plague which spreads via rodent fleas.

Science News Letter, October 7, 1950

MEDICINE

Smoking in Lung Cancer

Arsenic from insecticides used to protect the tobacco plants may be the chemical in tobacco smoke which causes cancer. Inhaling does not seem to make any difference.

► SMOKING is an important factor in causing cancer of the lung, two medical scientists conclude from a study reported to the *BRITISH MEDICAL JOURNAL* (Sept. 30).

Arsenic in insecticides used to protect the tobacco plants may be the chemical in the tobacco smoke that causes the cancer, they suggest.

The scientists are Dr. Richard Doll of the statistical research unit of the Medical Research Council and Dr. A. Bradford Hill, honorary director of the same unit and professor of medical statistics at the London School of Hygiene and Tropical Medicine.

Their conclusions about the part smoking, especially cigarette smoking, plays in causing cancer are based on studies of the smoking history of 1,732 patients with cancer of the lung, stomach or large bowel and 743 general (medical and surgical) patients who did not have cancer. Of the can-

cer patients, 649 men and 60 women had cancer of the lung.

Among the lung cancer patients 0.3% of the men and 31.7% of the women were non-smokers. In this study a smoker was defined as a person who had smoked as much as one cigarette a day for as long as one year.

Among non-cancer patients 4.2% of the men and 53.3% of the women were non-smokers.

After the age of 45, the scientists found, the risk of developing lung cancer increases in simple proportion with the amount smoked. The risk may be about 50 times as great among those who smoke 25 cigarettes a day as among non-smokers.

Whether or not the smoker inhales does not seem to make any difference. Since the size of the smoke particle which carries the cancer-causing chemical is unknown, noth-

ing can be said about the effect any change in rate and depth of breathing may have on the extent and site of deposition of the cancer-causing chemical.

In suggesting that arsenic from insecticides on tobacco plants may be the chemical in tobacco smoke that causes lung cancer, the scientists point out that the only cancer-causing chemical that has been found in tobacco smoke is arsenic. However, the evidence that arsenic can produce cancer of the lung is "suggestive rather than conclusive," they state.

If arsenic is the cancer-causer in tobacco smoke, it might account for the observation that deaths from cancer of the lung have increased more rapidly than the consumption of tobacco.

Science News Letter, October 7, 1950

ENGINEERING

Counter Measures Three Kinds of Radioactivity

► DEVELOPMENT of the first instrument that can count all three kinds of radiation from uranium—A-bomb ingredient—is claimed in Schenectady, N. Y. The new instrument, called the universal scintillation counter, not only detects and counts alpha, beta and gamma radiation, it also does this job more efficiently than any other instrument detects and counts



IDENTIFIES BIG THREE—The universal scintillation counter analyzes the white square of paper which contains the smear from object suspected to be contaminated. The instrument is able to check the smear for presence of alpha, beta or gamma rays, which are the "big three" of nuclear radiation. Mrs. Ethelyn Langdon, engineering assistant, operates machine.

only one kind of radiation.

Developed by General Electric Company engineers, the new counter is designed for use in testing laboratory equipment, in measuring radiation of ore samples, and in determining how fast radioactive substances disintegrate.

The instrument is set up to test samples

of material two inches square. Radiation from a sample strikes a phosphor, a substance which gives off light in the presence of radioactivity. The light hits an electronic tube, which converts the light into electrical energy. A counting circuit is then activated by the electrical energy

Science News Letter, October 7, 1950

RADIO

Radio Channels Double?

➤ HIGH hopes for doubling the number of available radio channels is promised by the use of what scientists call a single-sideband system of broadcasting. The system is approaching perfection.

Much work is being done by various institutions throughout the country in developing this single-sideband system. Included are technicians of Rutgers University in New Brunswick, with Prof. James Leroy Potter as the local leader.

Purpose of the work is to make more radio channels available. There are over 2,100 standard radio broadcasting stations in the United States now. There could be perhaps twice as many except for the technical difficulty that no channels, particularly in heavily populated areas, are available under the present broadcasting.

The single-sideband system, on which Prof. Potter is working in an integrated national research effort, may eventually dissolve the log-jam of stations frantically seeking airspace, he recently stated. It is still far off, however, since special receivers are necessary.

As explained by him, present radio receivers, set to pick up a certain broadcast frequency, actually receive two separate signals, one slightly above and the other slightly below the broadcasting frequency. These are the sidebands. The receiver combines them into a single perfect signal. Because of these sidebands, frequencies allotted to broadcasting stations have to be

spread quite far apart to prevent interference.

Among others working on sideband transmission are the U.S. Air Force and Stanford University in California. A new and radically simpler single-sideband transmitter was revealed by the latter recently. It was based on developments carried out in New Jersey laboratories of the Air Force.

The device utilizes only one of the sidebands formed. It eliminates the carrier signal completely. Voices transmitted by the single-sideband system are received as gibberish on ordinary receivers. Special receivers will be necessary if the system becomes widely used. The communication-type sets used by amateurs can be converted to receive them by a simple adjustment.

Science News Letter, October 7, 1950

METEOROLOGY

October Weather Will Change in Circles

➤ OCTOBER will be different this year. The Middle Atlantic states will experience much above normal temperatures. Montana, Idaho, and Wyoming will be much below normal in temperature. From these two centers the temperature will get gradually warmer and colder in ever-widening circles. But there will be little of the country that experiences a near normal temperature.

This is the word of the Extended Forecast Section of the U. S. Weather Bureau.

Where the temperature is much below normal, there will be snow. All over the country, precipitation, including both rain and snow, will be heavier than normal, except in the Pacific coast states, the South Atlantic states and along the Gulf coast. There less rainfall than normal is expected.

For most people this will be an unusual October

Science News Letter, October 7, 1950

SCIENCE NEWS LETTER

VOL. 58 OCTOBER 7, 1950 No. 15

44,000 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W. Washington 6, D. C., North 2255. Edited by WATSON DAVIS.

Subscription rates. 1 yr., \$5.50, 2 yrs., \$10.00, 3 yrs., \$14.50, single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925, 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N. Y. C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STAt 4439.

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MEDICINE

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What chemical in tobacco smoke may cause cancer? p. 227.

VETERINARY MEDICINE

Aftosa Lab Killed

Congress, beset by the faint-hearted, refused money to set up a laboratory off the Rhode Island coast for the study of aftosa after previously authorizing the project.

► THE ABSENCE of one small item in the \$17,000,000,000 supplemental appropriations bill must have struck fear into the heart of the Devil, despite his gloatings over H-bombs, bigger bazookas and more battalions.

By legend, the Devil has cloven hoofs. And when Congress killed an Agriculture Department project to build an animal disease laboratory off the Rhode Island coast, all cloven-hoofed animals—cattle, sheep, swine and goats as well as Lucifer—moved deeper into the shadow of one of the most dangerous plagues in the world, foot-and-mouth disease.

On Prudence Island, in Narragansett Bay, was to be built the largest laboratory in the world devoted to study of foot-and-mouth disease. Congress approved the need for such a laboratory somewhere in the United States in 1948. Last year \$500,000 was appropriated to pick a site, secure options on the land and prepare plans for the research center. Prudence Island was then chosen as the best possible location in the country.

But Congress now has refused the money to build the laboratory. It met the frightening opposition of such organizations as the Cape Cod Milk Goat Breeders Association, the Newport, R. I., County Chamber of Commerce and the Rhode Island Federation of Garden Clubs.

With great indignation, these groups joined dairymen, cattle breeders and resort owners in the area in protesting that the proposed laboratory was a menace to public health, the New England farmer, the summer resort tourist trade and the safety of the milk and meat supplies of the nation.

The organism that causes foot-and-mouth disease is a filterable virus. It is so small it can be seen only under an electron microscope. Highly contagious, it can race like wildfire through a cattle herd. Cattle men fear it above all other diseases, for there is no cure. Infected animals must be killed and buried under lime. If the disease once gained a foothold in the United States, it would almost certainly disrupt the nation's livestock industry and meat supply.

For nearly four years, scientists of this country and Mexico have been waging a desperate battle to stamp out foot-and-mouth disease below the Rio Grande. The border has been closed to all cattle shipments since 1947, and Uncle Sam has spent \$119,000,000 and sent 900 Americans to help fight "aftosa," as Mexicans call foot-and-mouth.

In a laboratory outside of Mexico City, the scientists achieved what was believed to be impossible—eradication of the disease,

not by mass destruction but by vaccination. A new serum, administered four times to every animal in a 205,000-square-mile quarantine belt, stopped the disease from spreading. Since last December, there has not been a new case.

It will take two more years to learn whether the new technique really has worked, or whether the virus is merely dormant until the immunization of the cattle wears off. Meantime, production of the vaccine has ceased. Only a rigid in-

spection system is now being carried on.

In this country, no research on foot-and-mouth disease is permitted. Congress passed a law that the virulent virus could be studied only on an island separated from the mainland by deep navigable waters. The Agriculture Department now has no such laboratory—nor will it have, this year at least.

In its request for funds—to carry out Congressional directions—Agriculture hoped at last to obtain a laboratory where new knowledge and new vaccines might someday wipe out even the threat of foot-and-mouth disease.

But then came the bellows from Rhode Island—"We approve highly of a laboratory, but we don't want it here," said witness after witness.

Congress meekly concurred, and the United States, this year at least, will not have a single place where scientists are allowed to study the dread plague of animals with cloven hoofs.

Science News Letter, October 7, 1950

MEDICINE

New Dressings for Burns

► NEW dressings almost as big as a blanket are on their way to Korea for better treatment of large-sized wounds and burns our fighting men may suffer.

The smaller of the two new dressings is about five times larger than the largest size single dressing now in use. It measures 19 by 34 inches. The larger one measures 43 by 45 inches.

The dressings are made of a layer of highly absorbent fine mesh gauze, a layer

of absorbent cotton, a layer of non-absorbent cellulose and an outer layer of paper. The gauze layer that goes next to the wound may be treated to reduce irritation to wounds. The non-absorbent layer prevents bacteria from entering the wound. Both gauze and paper are buff color.

One advantage of the new dressings is that they can be left on for as long as two weeks, instead of having to be changed every day or two as at present. Another is



BLANKET DRESSINGS—The bigger dressing for burns is easily applied, as shown in the picture, and can be left on as long as two weeks.

the greater ease and speed with which the big wound or burn can be covered

The extensive burns and wounds from high explosive bombs, blast and fires during the last war and the possibility of equally extensive burns and wounds in

case of any future atomic bomb bursts, many of which would have to be dressed in a hurry by relatively untrained lay persons, led to development of this new type dressing by the Army Medical Service's research and development board.

Science News Letter, October 7, 1950

GENERAL SCIENCE

Gov't-Financed Research

➤ SCIENTIFIC progress in America will depend more and more in the future upon government-supported laboratories and research institutes, Dr. Selman A. Waksman, pioneer in the development of the "miracle drugs," the antibiotics, told a distinguished gathering of U. S. and foreign scientists in New Haven, Conn.

Dr. Waksman, who discovered streptomycin at the New Jersey Agricultural Station, spoke at 75th anniversary observances of the Connecticut Agricultural Experiment Station in New Haven, Conn., oldest in the nation.

He pointed out that the great capital investments and costs of modern research can often be met only by states or the federal government.

"Government-supported institutions . . . will serve as one of the most important fountains of research," Dr. Waksman said, "which will continue to be the fundamental base for stimulating industry and agriculture, and lead to improvement of public health and human welfare."

As examples of the scientific contributions of government-supported institutions, Dr. Waksman cited the development of hybrid corn, vitamin D, better understanding of the protein value of plants, and

the overall study of soil fertility and microbiology. He also cited the study of the actinomycetes in the soil which led to the discovery of streptomycin, chloromycetin, aureomycin and many other new antibiotics.

"Today, in America alone, more than 1,000 investigators are said to be studying the actinomycetes," he said.

The present age may be designated either as the "atomic age" or the "antibiotic age," Dr. Waksman commented. In whatever field of science, however, "it is the coordination of the discoveries of individual investigators, on the one hand, and of the team of research workers on the other, that will yield the great secrets of nature, for the benefit of man. . . . Let us hope that modern society will learn to use these discoveries for its own well-being rather than for its destruction."

Other speakers at the anniversary symposium, who discussed the various non-governmental types of research institutions, included Dr. Edmund W. Sinnott, director of Sheffield Scientific School at Yale University, Dr. George O. Curme, Jr., vice-president of Union Carbide and Carbon Corporation, and Dr. Alexander Wetmore, secretary of the Smithsonian Institution.

Science News Letter, October 7, 1950

METEOROLOGY

Rain from Smoke Pall

➤ THAT Canadian smoke which covered a large part of eastern United States during the last part of September might have caused widespread rains. If the proper cloud conditions had existed, the extra amount of tiny particles in the air as a result of the fire could have changed the clouds into rain.

Dr. Vincent Schaeffer, the original rain-maker who works with Dr. Irving Langmuir of General Electric Laboratories, Schenectady, N. Y., told Science Service that there had been several local snow showers around Schenectady, which came from low clouds in a rather unusual manner.

Dr. Schaeffer, however, does not believe that the smoke particles themselves could have been the sublimation nuclei which are the trigger for rain. Heat from the fire, he explained, would cause a tremendous convection which would lift an abnormal

amount of tiny mineral particles from the soil into the air. These would travel along with the smoke and could have been the sublimation nuclei.

While there might have been a great deal of rain along with the smoke if cloud conditions were right, there also is the possibility that the fire would have produced too many nuclei. This is known as "overseeding" to rainmakers and when that happens, either in deliberate attempts to make rain or in nature, it fails to produce the rain.

Weather Bureau experts in Washington, however, debunked the idea that the Canadian fire might have caused widespread rains. Dr. F. W. Reichelderfer, chief of the Bureau, told Science Service that it all depends on whether you believe in one of the two schools of thought about rainmaking or the other.

Most Weather Bureau meteorologists, he explained, believe that nature provides enough sublimation nuclei to make most of the rain that is going to come down. If that is the case, he explained, more nuclei will not help to any really noticeable extent. But, he went on, if you believe as the rainmakers do that nature many times does not provide enough nuclei, then you might have expected more rain, if cloud conditions were right, to follow the spread of the Canadian smoke.

Dr. Harry Wexler of the Weather Bureau explained that the smoke haze occurred, with or without its rainmaking potentialities, because the Canadian fire coincided with the beginning of the winter pattern of the weather. That winter pattern, he said, brought a strong flow of cold air down from Canada. The cold air was confined under a "lid" in the atmosphere two and a half miles high, caused when the temperature, instead of decreasing with height, either stayed the same or increased.

Science News Letter, October 7, 1950

ENGINEERING

Tiny Rocket Motor Tests Fuels for Full-Size Missiles

➤ ONLY two pounds of fuel per minute are consumed in a tiny rocket motor in laboratories of the Massachusetts Institute of Technology. This motor is used in studying fuels for full-size rocket-powered missiles which might use 12 tons of fuel per minute.

This "microrocket" has already proved its value in testing rocket engine fuel efficiencies. Its great advantage is the low cost of testing because of the small amount of fuel used. Also, because of its size, elaborate safety precautions are unnecessary.

The microrocket operates on exactly the same principle and with the same high efficiency as the rocket missiles being developed for warfare. The fuel testing is part of a comprehensive project under way at the Institute under the sponsorship of the U.S. Navy. The research is under the direction of Profs. Hoyt C. Hottel and Glenn C. Williams of the MIT, chemical engineering staff.

Although built to use any liquid fuels, this microrocket has to date been used chiefly with a combination of liquids that ignite on contact. When they come together inside the motor, the resulting flame makes a tremendous amount of heat and therefore power.

On two pounds of fuel it runs for one minute, builds up more than 300 pounds of pressure inside the motor, and shoots gas out its nozzle at a speed of about 5,000 miles per hour. The German V-2 rocket used 12 tons of fuel per minute. A testing engine that operates on very small quantities of fuel is important because some of the newer fuels are quite scarce.

Science News Letter, October 7, 1950

GENETICS

No White Race in Future

With or without atomic war the white race as we know it will be dissolved in the world's melting pot. The future citizen of the world will be largely Asiatic in descent.

➤ THE white race will be wiped out in the future, whether or not an atomic war destroys civilization.

This is the prediction of Prof William C. Boyd, anthropologist of Boston University, made in a new book, *GENETICS AND THE RACES OF MAN* (Little, Brown) published in Boston

If there should be an atomic war and it did not make the whole earth uninhabitable, it would leave the human species to be perpetuated mostly by the populations of regions not reached by modern weapons. These might include the aborigines of the Australian desert, the Eskimo and others in the polar regions and the natives of central Africa, Prof Boyd points out.

However, Prof Boyd believes it more constructive to work on the assumption that atomic war will somehow be avoided

"Let us suppose, for the sake of argument," he writes, "that organized civilization will avoid destroying itself by the use of atomic bombs, radioactive dust, bacteriological warfare, poison gas, or anything similar, and that the same racial groups which we have at present will continue to contribute to the racial picture in the future."

In that case, the future citizen of the world state will be largely Asiatic by descent, with the Africans, Americans and Europeans coming in a very bad second.

There will be a considerable degree of miscegenation, he predicts, and eventually much less difference between men in different parts of the world, especially in regard to skin color and types of face and hair. How straight versus kinky hair will make out is hard to predict. But this is how Prof Boyd pictures the man of the future.

He will have dark brown eyes, a brown skin and straight or perhaps slightly wavy hair. He will be a low-brow, with head very short in relation to width.

Prof. Boyd has little hope for the success of plans to "improve" human stock. In the first place, it would be necessary to decide what human traits are good and which traits are better than others

"It is not easy to say with confidence that any of the varieties of ability are bad, and others are good

"There are a few human genes which it would undoubtedly be desirable to eliminate, if this could be done without causing more suffering in the process of elimination than their presence among us causes now," he states.

But eliminating a gene is not always easy. If it is dominant, then the problem is relatively simple. Sterilization of all affected

persons or the voluntary avoidance of reproduction of offspring by them would wipe out a dominant trait in a single generation.

Unfortunately, however, most of the human genes known to be undesirable are recessive and in this case sterilization would act very slowly. Sterilization of all albinos, for example, would only reduce the incidence of the gene to half in a period of time equal to the entire Christian era.

"For the time being, at least," Prof. Boyd concludes, "we shall do much better to devote our energies to making better education available to those who already possess genes making them capable of benefiting from it, and to attempt to improve the mutual understanding and relationship of various groups of men who at present consider themselves racially or culturally distinct."

Prof Boyd suggests that at present it would be much more scientific to classify human beings into races on the basis of blood groups rather than on such superficial characters as skin color, height or hair texture. This scheme would divide the world into six races. An early European group, represented today only by their sole

survivors, the Basques; a European (Caucasoid) group; African (Negroid) group; Asiatic (Mongoloid) group, American Indian and Australoid groups

Science News Letter, October 7, 1950

ZOOLOGY

Rare Guadalupe Fur Seal On San Nicolas Island

➤ A RARE Guadalupe fur seal, once slaughtered in great numbers but thought recently to be extinct, has been reported on San Nicolas Island off the southern California coast.

A single male, five and one half feet long weighing an estimated 300 pounds, was discovered by Dr George A Bartholomew, University of California at Los Angeles zoologist.

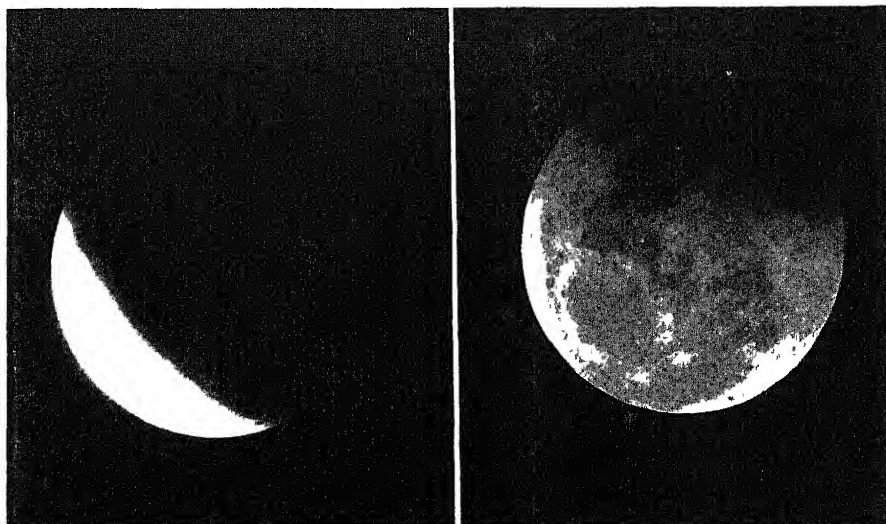
The last known breeding ground of this species of fur seal, according to Dr. Bartholomew, was the island of Guadalupe in Mexican waters. He recently spent two weeks on this island, however, without finding any trace of the Guadalupe fur seal.

But when he visited San Nicolas Island, 400 miles north, the single male was discovered, identified and photographed

Dr. Bartholomew believes that this male is a member of a new colony that has begun to propagate on San Nicolas or some other Channel Island off the southern California coast.

It may, however, be the last surviving individual of the Guadalupe colony.

Science News Letter, October 7, 1950



ECLIPSE SNAPS—Photographs of two phases of the moon's total eclipse the night of Sept. 25-26, the last total lunar eclipse visible from the United States until 1953. On the left the moon is just coming out of the total eclipse. The bright, shiny sliver of light is that part of the moon again illuminated by the sun. The other picture is of the moon almost clear of the earth's shadow. Both photographs were taken with the 26-inch telescope at the U. S. Naval Observatory, Washington, D. C.

METALLURGY

Fireproof Sterling Silver Developed in England

➤ A NEW sterling silver alloy which is not stained by fire has been developed by English scientists. The discovery promises more beautiful objects of silver, from belt buckles to tea sets.

Secret of the silver's fire resistance is the addition of one percent of aluminum to the basic alloy. By law, all sterling silver must contain 92.5% pure silver. Copper normally makes up the remainder of the alloy, giving it better working qualities.

But in the silversmith's art, high temperatures must be used for annealing and soldering. Under this heat, oxygen from the air reaches the copper and forms colored oxides, producing a firestain which is often very difficult to remove.

The aluminum in the new alloy, however, oxidizes first. A thin film of aluminum oxide forms on the surface of the object and prevents oxygen from penetrating the metal and oxidizing the copper. The stain is limited to a thin surface layer which is easily removed in final buffing and polishing.

If the aluminum content is less than 0.9%, according to the report of England's Design and Research Center, the oxide film is not continuous enough to shut out the oxygen; if it is above 1.5%, the working properties and color of the silver are noticeably affected.

The new alloy has been covered by a provisional patent in England only to insure that it is freely available to all silversmiths.

Science News Letter, October 7, 1950

Battle against Forest Insect Ravage Stepped up

➤ THE government is stepping up its long-term battle against an enemy which ranks with fire in ruining American timberland—the forest insect.

Dr. Harvey J. MacAloney, veteran insect scientist of the Agriculture Department, was named to head a new warning network designed to spot insect outbreaks before they reach the point where, like fire, they can race out of control through valuable timber.

A Forest Insect Survey was approved by Congress in 1947. Although it is still in skeleton form, eventually the Survey hopes to cover all 48 states with a system of trained observers. These men, many working on a volunteer basis, will keep sharp eyes cocked for dangerous buildup of the tiny forest marauders.

One of the most serious of these, at present, is the spruce budworm, eating its way through a million acres of Pacific Northwest Douglas fir, white fir and spruce.

Seven forest-dusting pilots were killed this summer in fighting the budworm plague, which earlier had brought ruin to 2,000,000-000 acres of forest in Alberta.

Other pests, which in some parts of the country cause damage far exceeding fire losses, include bark beetles and a host of those insects that chew the foliage of trees.

The insect network will be a weapon against fire as well. Trees which have been killed by pests are prime fire hazards.

Science News Letter, October 7, 1950

ENGINEERING

Specially Designed Radar Sets Aid Weather Tracking

➤ SPECIALLY designed radar sets with ranges of 200 to 250 miles, working in pairs, will be a valuable aid to weathermen in tracking storms and hurricanes. A pair of radar sets, one in Fort Monmouth, N.J., and the other in Cambridge, Mass., right now are busy tracking storms in experimental work for the Army Signal Corps.

Signal Corps experts believe this method of keeping continuous track of a storm from two angles will provide much valuable information about the origin and progress of such disturbances. Right now, the radar operators are trying to learn exactly what it is that they see on a radar scope trained on a patch of sky.

They know that the frequency on which radar signals are broadcast and the size of raindrops which these signals hit have a bearing on the kind of signal pictured on the scopes. However, they do not yet know exactly how big raindrops have to be before radar signals will bounce back from them to the radar. Signals bounce off ice crystals also and therefore the same problem exists. These and other problems may be solved by experiments with the two radars now in use.

Science News Letter, October 7, 1950

VETERINARY MEDICINE

Cattle Disease Kills 400 Army Deer

➤ "BLACKLEG," a disease which kills thousands of young cattle annually in the United States, has now been found to attack wild deer.

At the Army Proving Grounds in Aberdeen, Md., more than 400 out of about 2,500 deer which roam the reservation have died of the disease. The deaths are reported by Army veterinarians, Lt. Col. H. L. Armstrong and Maj. J. K. MacNamee, in the JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION.

Although blackleg can be prevented by vaccination, it is fatal to young cattle which are not immunized, and sometimes attacks sheep and other livestock.

Science News Letter, October 7, 1950



NUCLEAR PHYSICS

Swiss Mountain Scene of Cosmic Ray Research

➤ THE SUMMIT of Switzerland's 13,600-foot Jungfrauoch mountain will be occupied this winter as a cosmic ray observatory by four University of Manchester scientists who will study the production of meson atomic particles by these penetrating radiations from outer space.

Dr. P. M. S. Blackett, Nobelist and British atomic scientist, will lead the team, which will use a 14-ton magnet and cloud chamber apparatus to observe the mesons, which are the particles that are involved in the constitution of the atomic heart.

Previous explorations of cosmic rays have led the same group of scientists to conduct experiments deep in London subways and British coal mines.

Science News Letter, October 7, 1950

AGRICULTURE

2, 4-D Colors Potatoes For Buyer "Eye Appeal"

➤ DON'T be surprised if your wife brings home some potatoes she purchased because "they are pretty."

A method of using the well-known weed killer, sodium salt of 2,4-D, to intensify red skin color and increase vitamin C content of Red McClure and Bliss Triumph varieties of potatoes has been reported in synthetic plant hormone studies by the Colorado A & M College Experiment Station, Fort Collins, Colo. The 2,4-D is applied as a spray to the vines while the potatoes are still in the ground.

Intensifying the red color is aimed at providing a potato with eye appeal to the commercial buyer as well as the housewife. By increasing vitamin C content up to 125% through spraying with 2,4-D, the potatoes will provide a larger portion of the daily body requirement of vitamin C in a cheap food, Station chemists point out.

Because potatoes form such a large part of the nation's food supply, they provide much of the vitamin C requirement. A tendency toward tougher skins, which would be an advantage at digging time, has also been noticed.

Growers of red-skinned potatoes have been warned to be especially careful in use of plant-killing 2,4-D to "color" and increase vitamin C content of the spuds. Recommendations for using 2,4-D have been prepared by Dr. Jess L. Fults, Colorado Experiment Station botanist, and Dr. Lawrence Schaal, USDA plant pathologist.

Science News Letter, October 7, 1950

HOME ECONOMICS

Aluminum Takes Fresh Fish to Market

➤ FRESH fish which travels from wharf to market packed in light, airtight aluminum containers is the advance guard in a revolutionary new method of distributing perishable foods now being tested in England.

Although the fish is marketed in cans, it is not "canned fish" in the usual sense. It is as fresh as if the housewife picked it from a barrel of ice in the grocery store and carried it home wrapped in the traditional newspaper.

The aluminum containers take the place of the ice in preserving freshness. Choice fish straight from the trawlers is filleted by skilled workers working near the fish docks at Hull, England, sealed in the aluminum cans and sent to wholesalers and retailers in London, Manchester, Southampton and other cities for sale.

The venture could be the forerunner of similar packaging methods for other types of perishable foods. Fresh vegetables, fruit or meat conceivably could be transported in the same sort of containers. They give protection not only from air and high temperatures (the aluminum reflects heat rather than absorbs it) but also from rough handling.

Exhaustive tests have proved the fish shipped in this manner reach the consumer in good condition. Waste and nearly all bones are removed at a central location. The fish are washed in water which contains a small amount of chlorine to destroy surface germs. Tightly packed in cans ranging from one to 14 pounds capacity, they represent a solid block of fresh fish surrounded by a light sheet of aluminum, which is a tough customer in the knocks and jolts of freight transportation.

Science News Letter, October 7, 1950

ENGINEERING

Stainless Steel Promises Larger TV Picture Tubes

➤ LARGER rectangular pictures in home television sets are promised with the development of a new stainless steel particularly suitable for use in picture tubes because it has a heat expansion rate practically the same as that of the glass screen.

TV tubes with metal sides and glass fronts are more durable than tubes of all glass and they can be constructed in larger sizes and in rectangular shape. One difficulty has been a suitable metal that will expand and contract at the same rate as the glass under the heat conditions devel-

oped in the tube. If the expansion rates are different the glass will crack.

Stainless steel is a desirable metal in television tubes because it is durable and non-corrosive. The new steel was announced in New York by United States Steel Corporation. It was developed by Carnegie-Illinois Steel Corporation, a subsidiary, in cooperation with video vacuum tube manufacturers. It is an alloy containing 17% chromium. By special processes its grain structure is stabilized without changing its other desirable characteristics.

Science News Letter, October 7, 1950

ENGINEERING

Boron and Carbon in Electrical Resistors

➤ NEW electrical resistors in which a thin film of carbon and boron takes the place of tightly-wound wire coils were described in Chicago, Ill., at a National Electronics Conference.

The new units, developed at Bell Telephone Laboratories in New York, were discussed in a technical paper presented by Bell engineers R. O. Grisdale, A. C. Pfister and G. K. Teal.

Resistors with carbon films laid on ceramic cores have seen increasing use in recent years. The addition of the element boron to the film has further improved the electrical characteristics of the resistors, and opened the way for widespread use in the communications and electronics fields. Boron-carbon resistors, said the engineers, are smaller and less expensive than wire-wound types designed for the same jobs.

Science News Letter, October 7, 1950

BIOLOGY

Penicillin Increase Due To Mold Heredity Change

➤ A FOUR-FOLD increase in the output of penicillin has resulted from scientists' ability to change the heredity of the mold that produces this first of the antibiotic wonder drugs.

This accomplishment, of live-saving importance to millions throughout the world, was cited as one of many examples of the benefits of the modern science of genetics by Dr. Conway Zirkle of the University of Pennsylvania at the American Institute of Biological Sciences meeting at Ohio State University in Columbus.

Plants and animals have been bred to give man more foods and in the field of human heredity, Dr. Zirkle pointed out, geneticists and physicians have combined to find ways of predicting which couples are going to have babies afflicted with the often fatal Rh blood disease. As a result, many such tragedies have been prevented.

A formula for pre-birth prediction of anemia in a laboratory animal of pure genetic stock was also reported.

Science News Letter, October 7, 1950

MEDICINE

Videognosis for Rural Patient

➤ SICK and injured patients in rural hospitals may some day have the diagnostic services of big city medical specialists via a new technique called videognosis.

The technique, consisting in television transmission of X-ray pictures, has already worked successfully in trials by Dr. J. Gershon-Cohen and associates of the Jewish Hospital of Philadelphia.

The specialist and the physician at the patient's bedside confer by telephone while viewing the X-ray picture and its televised image.

The television image is said to be better in some respects than the original X-ray picture because dark and light contrast can be made greater for easier reading and special parts can be magnified by focussing of the transmitting camera.

Science News Letter, October 7, 1950

NUCLEAR PHYSICS

Small Plastic Vial Is New Radiation Detector

➤ A PLASTIC vial about two inches long and half an inch in diameter is the latest device protecting workers in U. S. atomic energy plants and laboratories from overdoses of radiation.

The miniature detector, worn on the clothing during working hours and then checked by recording instruments over a double radiation range, was announced recently by scientists at Argonne National Laboratory in Chicago, Ill.

Its invention makes possible for the first time radiation measurement over two different dosage scales, using a single detecting device carried by an individual who works with radioactive materials.

The plastic cylinder is filled with air. Inside is a thin plastic rod. An electrical field is established between the walls of the tube and the rod. Radiation causes this charge to "leak" away. By measuring the drop in charge after working hours, technicians can tell how large a dose of radiation the worker received.

The tube is hermetically sealed and lined with a thin film of grease and graphite to prevent any movement of dust particles through the air in the electrical field. In earlier instruments, dust caused leakage of the charge and produced a higher radiation reading than the amount actually received.

The new atomic pill bottles, although accurate and inexpensive, probably will not be practical for use by large numbers of ordinary citizens as radiation warning devices in case of atomic attack. There is no way to "read" them directly. Special indicating equipment and technicians to run it are needed.

Science News Letter, October 7, 1950

SAFETY

Check Bleeding First

Apply pressure immediately to stop bleeding from wounds, for loss of more than two pints of blood at one time is often fatal.

Second in a series on first aid for atom bomb casualties

By JANE STAFFORD

► LOOK for 1) serious bleeding, 2) difficult breathing or stoppage of breathing, and 3) poisoning. Treat immediately, in that order, before you do anything else.

This is the Number One rule which will be taught 20,000,000 persons throughout this nation who will be needed to give first aid in event of an atomic attack.

It is the prime rule to remember at any time you are giving first aid, whether to victims of a highway accident or to someone who is accidentally injured at home or at your place of work.

Victims of an atomic attack will suffer many kinds of injuries. There will be all the kinds that would come in an ordinary bombing attack, plus a few peculiar to the atom bomb itself. Flash burns, burns from fire and injuries from blast, from flying debris and from collapsing buildings can be expected in varying degrees, both as to number and severity.

From the bomb itself, of course, will come ionizing radiations, the alpha, beta, gamma, and neutron rays which are so mysterious and frightening to most people. The damage these do depends on the dose of them that gets inside the body.

As a first aider, you should not worry about radiation injuries. But if, two or three days after the bomb burst, one of your friends or neighbors complains of feeling sick, and perhaps has been nauseated and had diarrhea, you should suspect radiation injury and advise him to see a doctor promptly. Many borderline cases might be saved by transfusions of whole blood. And perhaps by the time an atom bomb drops on your town, medical scientists may have found other good treatments for the radiation injury from it.

Temporary Blindness

Some of the victims may complain that they cannot see. Unless the eyes are protected, the flash of the bomb could produce temporary blindness. Normal eyesight will return in about five minutes on the average, though this temporary blindness may last several hours.

You help these victims to a safe place, reassuring them, and of course treating any serious injuries they may have. But leave the eyes alone. You do not want to put anything in or on the eyes that might cause infection.

Radiation from the bomb can cause serious damage to the eyes. The number of these radiation cataracts so far reported among Japanese victims, however, has been small. They do not develop immediately and, like any other cataract, require treatment by an eye specialist when they do develop.

Immediately after the bomb goes off, you are going to be busy helping people with bad burns, torn and mangled limbs, gaping belly wounds with intestines and other internal organs showing, and people choking and gasping for breath because of pressure on chest and belly or a wound that has pierced the chest. And there will be others with mouth and nose so covered by sand, gravel and other rubble that they cannot breathe.

Remember that you must look first for serious bleeding and stop it. Loss of more than two pints of blood at one time can be serious and may be fatal. If a large artery or vein is cut, blood will pour out fast and in large quantities. Bleeding is serious if bright red blood spurts from a wound or if the blood is flowing freely, whether bright or dark. Blood from arteries is brighter than blood from veins and usually comes in spurts corresponding to the beating, or pumping action, of the heart.

Action at Once

You do not need to decide, however, whether the blood is coming from an artery or vein. If it is coming fast and does not stop by itself within four or five minutes it is serious and you must try to stop it. Remember, the victim may have been bleeding four or five minutes by the time you reach him. So if you see a lot of blood on his clothes or see the blood pouring from a wound, go into action at once.

Direct pressure is the most commonly used way to stop bleeding. You may have to put your hand right on the wound.

Sometimes pressing your fingers on the edge of the wound will stop the bleeding. If you have a sterile gauze compress, use it, but do not wait to get one. A clean handkerchief or cloth is better than your hand or fingers, but again, do not wait to find one. Depending on circumstances, you can send someone for a handkerchief or bandage, or the victim may be able to apply pressure while you get one. As soon as you can, substitute a cloth or dressing for your hands and fingers and press firmly on that. If this stops the bleeding, bandage the cloth or dressing tightly.

Look at the bandage frequently to see

whether bleeding has started again. If it has, you must apply more pressure. Do not take the bandage and dressing off, however. This might disturb or break the clot that is forming. The clot is nature's way of stopping bleeding.

Movement Risky

If the bleeding is from a wound in the neck, you cannot very well bandage a dressing in place. Put your hands above and below the cut and press firmly enough to stop the bleeding and keep up the pressure until a doctor tells you to stop. Because the blood will make the neck very slippery to hold, a compress of the cleanest material immediately available will be a great help in keeping the pressure on.

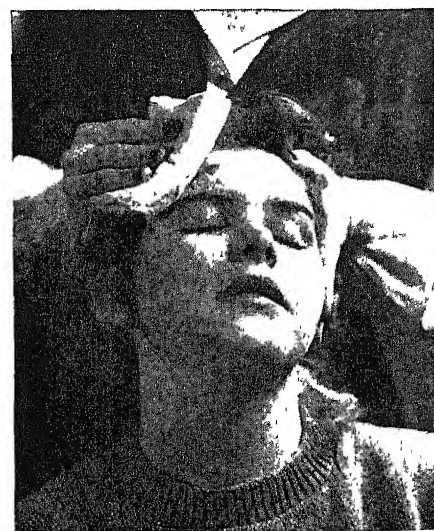
When bleeding is from the hands, feet, arms or legs, it may help to raise the injured part. If there is a broken bone, however, do not do this. Keep the injured part quiet, aside from the necessary manipulation to apply pressure and bandage and to raise it. Movement may loosen the clot and cause bleeding to start again.

A good way to stop serious bleeding in many cases is to press your hands or fingers on certain "pressure points." These points are where the main artery to the injured part lies close to a bone. The bone gives a firm object against which pressure can be applied.

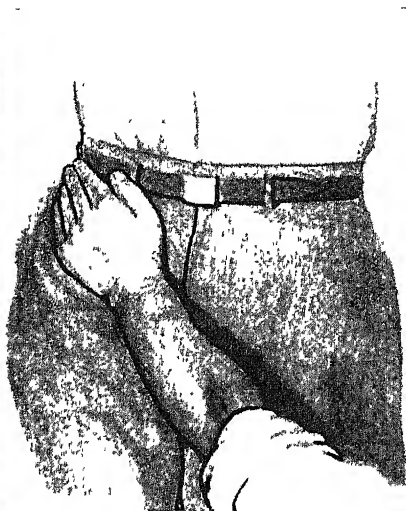
There are a number of these pressure points, but the two most practical for the first aider to learn and use are:

1. On the inner, or body, side of the arm, below the armpit and about halfway between shoulder and elbow.

2. In the mid-groin as the artery passes over the pelvic bone. Press downward, with



STOP THAT BLOOD—*Serious bleeding may be stopped by pressing on the wound with a sterile compress. If a compress or clean cloth is not available, use your fingers.*



PRESSURE POINTS—When blood flows freely from a wound, it may mean an artery or a vein has been severed. To stop such bleeding, first aid trainees are taught two main pressure points: For an arm wound, just below the arm pit; for a leg wound, where the leg joins the body.

your arm straight, pressing the heel of your hand into the middle of the groin.

You undoubtedly have heard about tourniquets used to stop bleeding. Remember

that they are always dangerous. Applied by someone who knows how, they are useful, but they should not be used if bleeding can be checked by other means.

Science News Letter, October 7, 1950

ECONOMICS

Economics Affects Vote

➤ **POLLSTERS** may be much more exact in their future election predictions because the United States Census Bureau has divided the nation into 443 "economic areas." A young population expert of the Bureau, working on his own time, has discovered a remarkable correlation between these economic areas and voting habits.

The expert, Calvin Beale, of the Bureau's Population Division, has found in preliminary studies that people in one economic area are likely to have a consistently different voting pattern than people in the neighboring economic area. This does not mean that all people in one economic area vote either Republican or Democratic—the only the pattern is different.

The areas—150 metropolitan and 293 non-metropolitan areas—were devised as a new tool in the study of many of the nation's problems. Already they are being used in planning of road systems, studies of migration and fertility.

Each of the economic areas consists of a county or group of counties within a state with agricultural, industrial and social characteristics that differentiate it from other areas. For purposes of study and research, this kind of area makes much more sense than the artificial, political boundaries of counties and states.

However, the new areas are a compromise in one respect. Since our vital statis-

tics are set up along county and state lines, the economic areas all consist of whole counties or groups of counties within states.

Dr. Donald J. Bogue, of the Scripps Foundation for Research in Population Problems, cooperated with the Census Bureau in setting up the new areas. It is his

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opinion that public opinion predictors will have to take cognizance of the new areas, making sure that their samples fairly represent all the different ones.

For pollsters, economists, sociologists and others who want to study problems on a national level, many of these economic areas may be combined across state boundaries. These combinations will probably be called economic sub-regions and economic regions. A sub-region will contain two or more similar economic areas without regard to state boundaries. A region is a grouping of several sub-regions which have the same fundamental characteristics. The nation can be divided into about 20 economic regions.

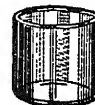
Science News Letter, October 7, 1950

On This Week's Cover

➤ THE first turbo-prop powered tactical attack bomber, the Douglas A2D Skyhawk, combines a short take-off, a high operating altitude, and a speed approaching that of a jet fighter with a high load carrying ability. The bomber's predecessor, the Douglas AD Skyraider, has been used in the fighting on Korea. Skyraiders struck from the carrier Valley Forge on July 3 after receiving authority to bomb North Korea and have been hitting installations steadily ever since with 6000-pound bombloads.

The bombload per mile per hour of the A2D is almost 50% greater than that of the AD while fuel consumption per pound of bomb per mile is substantially the same as that of the AD piston engine airplane. This comparison indicates a great improvement in performance efficiency.

Science News Letter, October 7, 1950



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ARCHAEOLOGY

Sutton Hoo Bone Not Bone

➤ THE FRAGMENT believed to be bone—the only trace of bone found in the archaeologically very important Sutton Hoo ship burial in Britain—is not really bone at all, it is indicated by Dr. H. Barker of the Research Laboratory, British Museum, London, in a report to the journal, *NATURE* (Aug. 26).

The Sutton Hoo burial is important be-

cause of the wealth of treasure in gold, coins, and delicate cloisonné jewelry as well as such imported items as silver dishes from Byzantium, gourd drinking cups from as far away as the south of France and a helmet from the Baltic coast of Sweden.

This burial, dated between 650 and 670 A.D., has puzzled archaeologists for two reasons. First, the "grave furniture" shows it to be a pagan grave in a pagan burial place, and yet there is reason to believe that the grave is that of one of the East Anglian kings, all of whom were devout Christians. There are also crosses and other clear signs of Christianity in the grave itself.

Another puzzle is the fact that when first excavated, no sign of a body was found.

Was this burial in an 80-foot rowboat on the east bank of the River Deben, in Suffolk, merely a public monument to a king? Did his body receive Christian burial somewhere else in consecrated ground?

The new finding from the research laboratory of the British Museum does not seem to throw any new light on this question.

Key to the deception of what was thought to be a piece of bone lies in the acidity of Sutton Hoo soil which does not favor the preservation of human bones. Chemical analysis of the "bone" showed it to be essentially a hydrated ferric phosphate containing only traces of calcium.

Dr. Barker visualizes the formation as taking place in this way:

While the acid of the soil would dissolve bones, the diffusion of corrosion products from nearby iron fragments in the structure of calcined or burned bone would, by the deposition of insoluble ferric phosphate, form a cast of the original bone. Thus the fragment found in the grave was not of unburned bone, as originally supposed, but actually an insoluble product from burned bone formed by contact with corroding iron under acid soil conditions.

Dr. Barker's report does not indicate that

there was any evidence that the original bone was human or that any indication was found that a cremated body was buried in the grave; the early Christians opposed cremation because it was believed that the body should be buried whole to favor resurrection.

Science News Letter, October 7, 1950

GENERAL SCIENCE

\$225,000 for National Science Foundation

➤ WHEN President Truman signed the \$17,000,000 supplemental appropriations bill, \$225,000 became available for the first year's operation of the new National Science Foundation. Originally designed to stimulate research in the more peaceful aspects of science, the Foundation may now find itself concerned with wartime jobs.

One of its jobs will be to keep a roster of the nation's scientific, technical and engineering personnel. This roster will be invaluable in case of an all-out mobilization. In addition, the Foundation might possibly be given the job of drafting scientists and engineers in the event of war.

Science News Letter, October 7, 1950

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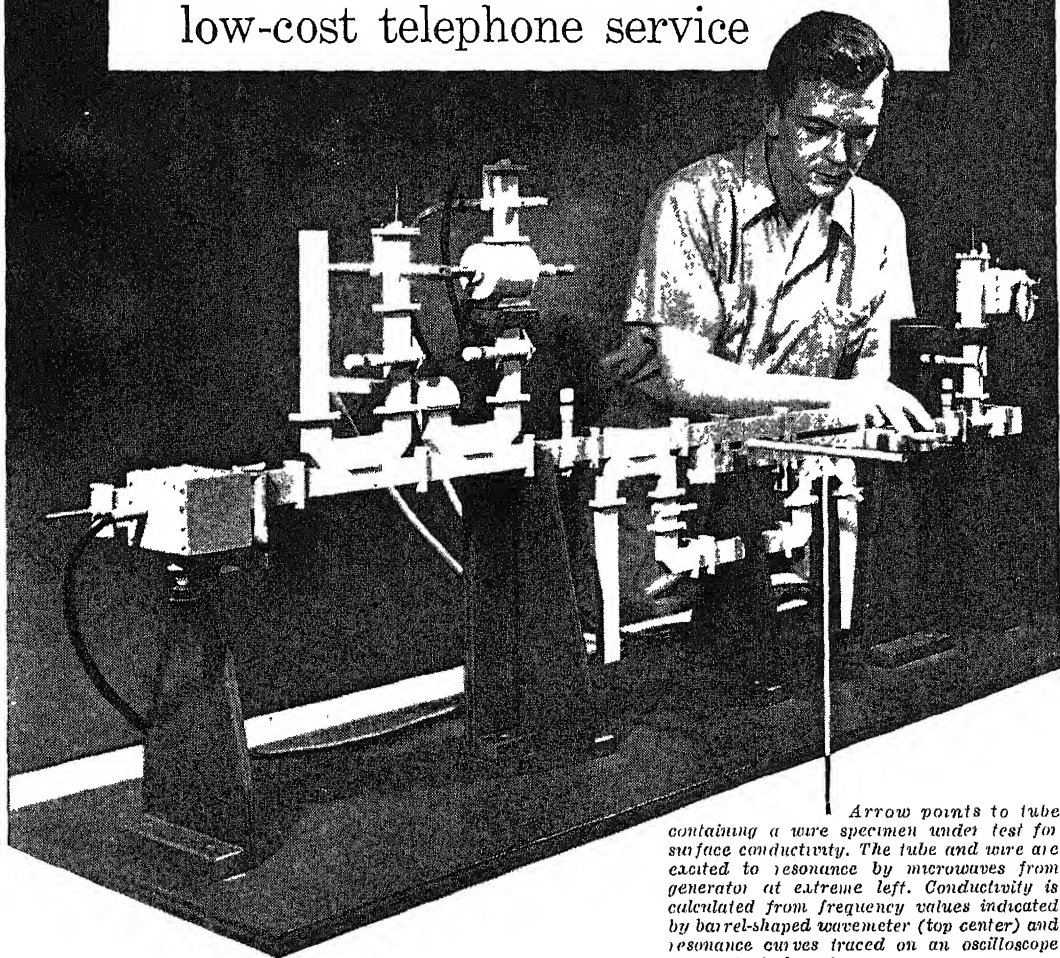
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Arrow points to tube containing a wire specimen under test for surface conductivity. The tube and wire are excited to resonance by microwaves from generator at extreme left. Conductivity is calculated from frequency values indicated by barrel-shaped wavemeter (top center) and resonance curves traced on an oscilloscope screen (not shown).

In the waveguides which conduct microwaves to and from the antennas of radio relay systems, current is concentrated in a surface layer less than 1/10,000 inch thick, on the inner surface of the waveguide. When these surfaces conduct poorly, energy is lost.

To investigate, Bell radio scientists devised exact methods to explore this skin effect at microwave frequencies. Scratches and corrosion, they found, increase losses by 50 per cent or more. Even silver plating, smooth to the

eye, can more than double the losses of a polished metal. Very smooth conductors, like electropolished copper, are best. An inexpensive coat of clear lacquer preserves initial high conductivity for many months.

Energy saved *inside* a microwave station can be used in the radio-relay path *outside*. So stations can sometimes be spaced farther apart, with more margin against fading. Here is another example of the practical value of research at Bell Telephone Laboratories.

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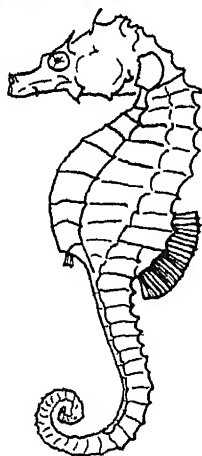
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ICHTHYOLOGY

NATURE RAMBLINGS



Sea Horse

➤ IN GREEK and Roman mythology, the sea horse was a fabulous creature, half horse and half fish, driven by sea gods and ridden by their daughters the sea nymphs. Medieval and even more modern writers put on a few trimmings: "The Sea Horse between Brittany and Norway is oft seen to have a head like a horse, and to neigh; but his feet and hoof are cloven like to a cow's; and he feeds both on land and in the sea. He is seldom taken, though he grows to be as big as an ox. He hath a forked tail."

Neptune's Pegasus is a queer enough little fish in its own right, without embellishments which make it a new form of sea monster. Only in Pacific waters where there is giant kelp in which to hide does the sea horse grow to as much as a foot in height; elsewhere it lives out its life only a few inches high. It has no hoofs, cloven or otherwise. Its tail is neither forked nor actually a tail, but part of its body. It has a tough hide stretched over a bony frame, which gives the impression that the sea horse wears a suit of armor.

Though the sea horse is really a fish, it acts like a monkey, coiling its posterior appendage around bits of eelgrass or seaweed and hanging there at anchor. The only difference is that the sea horse hangs head uppermost. The danger in the sea is not the chance of falling to the bottom but of falling upward to the surface.

Likewise the sea horse swims in a vertical position. Its gait is a series of short convulsive jerks—an elfin gallop hampered by blind staggers. Standing nearly upright in the water, it propels itself by a supple fin midway on its back which waves to and fro faster than the eye can see. There is a tiny fin beneath the sea horse's businessman

paunch, and two others spotted where humans have ears. By waving these and bending its head, the fish goes uphill or down.

Some say the sea horse has a jet in the top of its head for sudden crash dives. A naturalist who lives in a sea horse country says, "I have seen sea horses near the surface squirt a jet of water three inches into the air in their frightened efforts to submerge." But detailed studies of sea horse locomotion make no mention of such a blow-hole.

In the sea horse family, it is Pop who brings up the children. In breeding season the male develops a pouch like the pocket of a female kangaroo. The mother's eggs are laid in this pouch, and there the youngsters stay until they hatch and are old enough to swim. When they emerge, it looks exactly as if the father were giving birth.

Science News Letter, October 7, 1950

CHEMISTRY

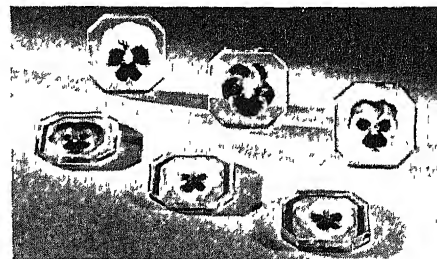
Filbert Nut Chemical Makes Cheese Better

➤ "IT'S the nuts" could be said of a new American cheese of superior flavor that was reported to the American Chemical Society in Chicago by four Oregon State College chemists.

Substances that help to digest protein—called proteolytic enzymes—can now be obtained from filbert nuts. They are used in cheddar cheese making. Tested for their effect on processing pasteurized milk into cheese, the filbert enzymes gave a product of better flavor which was described as mild and clean. The ripening time of the cheese was also substantially shortened, which reduces the expense of storage room.

Filberts are already a surplus crop in Oregon and many young filbert orchards will produce constantly increasing yields. The research on filbert extracts was done by Husain A. B. Parpia, Roy W. Stein, Thomas B. Niven and Ernest H. Wiegand.

Science News Letter, October 7, 1950



REAL PANSY COASTERS

These attractive coasters were made by embedding real pansies in Castolite, a new liquid casting plastic. With it students embed real flowers, butterflies, shells, photos, medals, etc. to make unusual jewelry, buttons, coasters, plaques, tiles, book ends, trays, other distinctive objects. Successfully used by hundreds of schools and colleges. New book gives instructions and ideas for making Christmas gifts. Send 25¢ for Castolite Manual. The Castolite Company, Dept. L-50, Woodstock, Ill.

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A S T. M. STANDARDS ON PLASTICS—A.S.T.M. Committee D-20—*American Society for Testing Materials*, 5th ed., 1077 p., illus., paper, \$4.85. Specifications, methods of testing, nomenclature and definitions

AIR POWER Key to Survival—Alexander P. de Seversky—*Simon and Schuster*, 376 p., illus., \$3.50 (Paper \$1.00). The author discusses peace through air power, defense in the atomic age and many other current military air power problems

AN ATLAS OF HUMAN ANATOMY—Barry J. Anson—*W. B. Saunders*, 518 p., illus., \$11.50. An atlas of gross anatomy whose pictorial content is based upon new dissections, serially prepared, and upon variable morphological features statistically presented.

THE COMPLETE BOOK OF BUILT-INS—William J. Hennessey—*Harper*, 182 p., illus., \$3.50. Many ideas are presented showing how to get more out of every square inch of floor space in your home.

EVALUATION OF INDUSTRIAL DISABILITY—Committee for Standardization of Joint Measurements in Industrial Injury Cases of the California Medical Association and Industrial Accident Commission—*Oxford University Press*, 89 p., illus., \$4.00. The committee has developed a standard method for measuring and reporting restriction of joint movement in industrial and other injury cases. For professional and lay use.

FLINT QUARRIES—THE SOURCES OF TOOLS AND, AT THE SAME TIME, THE FACTORIES OF THE AMERICAN INDIAN, Vol. XVII, No. 3: With A Consideration of the Theory of the "Blank" And Some of the Technique of Flint Utilization—Kirk Bryan—*Peabody Museum of American Archaeology and Ethnology*, 40 p., illus., paper, \$2.00. This monograph outlines several theories regarding quarries.

GENETICS AND THE RACES OF MAN: An Introduction to Modern Physical Anthropology—William C. Boyd—*Little, Brown*, 453 p., illus., \$6.00. An attempt to base physical anthropology on genetics instead of on older systems of bone measurement and skull conformation (See SNL, Oct. 7, p. 231.)

LABORATORY GUIDE—George S. Eby and others—*Ginn*, rev. ed., 160 p., illus., paper, \$1.28. A high school manual to accompany THE PHYSICAL SCIENCES listed in this book column.

MANUAL FOR COMPARATIVE ANATOMY—Leonard P. Sayles—*Macmillan*, rev. ed., 214 p., illus., paper, \$3.00. Provides for a one year course in vertebrate anatomy as given by the City College of New York. The manual is not designed to go with any special textbook.

MASKS AS AGENTS OF SOCIAL CONTROL IN NORTHEAST LIBERIA, Vol. XXXII, No. 2—George W. Harley—*Peabody Museum of American Archaeology and Ethnology*, 43 p., illus., paper, \$3.25. A monograph on the significance of masks in Northeast Liberia. There are 15 black and white plates.

MCCLUNG'S HANDBOOK OF MICROSCOPICAL TECHNIQUE—Ruth McClung Jones, Ed.—*Hoebner*, 3rd ed., illus., \$12.00. A handbook revised and brought up-to-date. For workers in animal and plant tissues.

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THE MEANING AND PRACTICE OF PSYCHOTHERAPY—V. E. Fisher—*Macmillan*, 411 p., \$5.00. Describes and illustrates procedures and techniques of therapy in neurotic and psychotic areas.

MECHANISM AND EVALUATION OF ANTISEPTICS—Herbert L. Davis, Consulting Ed. & Conference Chairman—*New York Academy of Sciences*, 219 p., illus., paper, \$3.00. A series of papers which resulted from a conference held by the Section of Biology of The Academy, October 28 and 29, 1949.

NEUROSIS AND HUMAN GROWTH: The Struggle Toward Self-Realization—Karen Horney—*Norton*, 391 p., \$3.75. A study of the individual's development under inner stress.

THE ORGANIZATION OF INDUSTRIAL SCIENTIFIC RESEARCH—C. E. Kenneth Mees and John A. Lecimakers—*McGraw-Hill*, 2nd ed., 383 p., illus., \$5.00. A revised edition covering the steps in organizing and operating an industrial research laboratory.

THE OTHER SIDE OF THE BOTTLE—Dwight Anderson—*Wyn*, 258 p., \$3.00. The author tells of his own recovery from a form of alcoholism. Supplementary case histories are also presented.

PARASITES OF THE PECAN NUT CASEBEARER IN TEXAS—C. B. Nickels, W. C. Pierce and C. C. Pinkney—*Gov't Printing Office*, U. S. Dept. of Ag. Tech. Bull. No. 1011, 21 p., illus., paper, 10 cents.

PERCEPTION AND PERSONALITY: A Symposium—Jerome S. Bruner and David Kiech, Eds.—*Duke University Press*, 266 p., illus., \$3.50. Originally published in the September and December, 1949 issues of the *Journal of Personality*, this symposium is concerned with the determinants of perceptual operation. Among the contributors are Gardner Murphy, Elliott McGinnies, Elsie Frenkel-Brunswick and David C. McClelland.

PHYSICAL PROPERTIES OF PLATED FABRICS KNIT OF COTTON, WOOL, VISCOSE RAYON, AND NYLON—Hazel M. Fletcher, Arnold M. Hansen, and Mary Ellen Duensing—*Gov't. Printing Office*, U. S. Dept. of Ag. Circ. No. 848, 29 p., illus., paper, 10 cents.

THE PHYSICAL SCIENCES—George S. Eby and others—*Ginn*, rev. ed., 535 p., illus., \$3.36. A high school text.

PLAY WITH TREES—Millicent E. Selsam—*Morrow*, 64 p., illus., \$2.00. A child's book with many experiments for both city and country children. Well illustrated by Fred F. Scherer.

PREJUDICE IN TEXTBOOKS—Maxwell S. Stewart—*Public Affairs Committee*, 31 p., illus., paper, 20 cents. A summary of an American Council on Education study. Concrete suggestions are offered for improvement of the teaching of intergroup relations at every school level.

THE PRINCIPLES OF PHYSICAL GEOLOGY—Victor

E. Monnett and Howard E. Brown—*Ginn*, 450 p., illus., \$4.50. An introductory college textbook.

PROCEDURE HANDBOOK OF ARC WELDING DESIGN AND PRACTICE—*Lincoln Electric Company*, 9th ed., 1200 p., illus., \$2.00 (Outside the U. S. \$2.50). A reference handbook brought up-to-date.

SIX NUCLEAR PHYSICS CHARTS AND A SUPPLEMENT BOOKLET—Westinghouse School Service—*Westinghouse Electric Corporation*, \$1.00 (Additional booklets may be obtained for 10 cents per copy). The charts measure 25 by 37 inches, are printed in two colors and show the basic particles of nuclear physics, construction of atoms, nuclear reactions, detection and measurement of nuclear energy and its industrial use.

THE SMITHSONIAN America's Treasure House—Webster Prentiss True—*Sheridan House*, 306 p., illus., \$3.50. An account of this museum's gigantic collections with a brief history of the institution included.

SOME SEX BELIEFS AND PRACTICES IN A NAVAHO COMMUNITY, Vol. XL, No. 2. With Comparative Material From Other Navaho Areas—Flora L. Bailey—*Peabody Museum of American Archaeology and Ethnology*, 108 p., paper, \$3.00. A monograph.

SURVEY OF MODERN ELECTRONICS—Paul G. Andres—*Wiley*, 522 p., illus., \$5.75. A college text for a summary course in electronics.

THE TECHNOLOGY AND CHEMISTRY OF ALKALOIDS—Frank E. Hamerslag—*Van Nostrand*, 306 p., illus., \$6.50. Primarily designed to aid those engaged in the manufacture of alkaloids.

TENSIONS THAT CAUSE WARS: Common Statement and Individual papers by a group of social scientists brought together by UNESCO—Hadley Cantril, Ed.—*University of Illinois Press*, 303 p., \$4.00. Discussions of the economic, political and technological conditions which produce tensions that cause wars.

TEXTBOOK OF PERIODONTIA (ORAL MEDICINE)—Samuel Charles Miller and others—*Blakiston*, 3rd ed., 900 p., illus., \$11.50. A revision of a college text dealing with diseases of the tissues surrounding the teeth.

TRAILBLAZER TO TELEVISION. The Story of Arthur Korn—Terry and Elizabeth P. Korn—*Scribner*, 144 p., illus., \$2.50. A short biography of a pioneer in television.

Science News Letter, October 7, 1950

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❄ **STEERABLE SLED** for children, recently patented, has a horizontal steering wheel mounted at the front end which is attached to two upright rolling wheels below. Both of these have sharp edges on their outer rims to bite into the snow. The steering device is for use on sleds with one set of continuous runners.

Science News Letter, October 7, 1950

❄ **WARNING LIGHT** for the automobile is attached on the left side near the front and flashes upward beams whenever the brake pedal is pressed. The beams are visible in all directions, pressing the pedal usually accompanies a right or left turn and also a decrease in speed.

Science News Letter, October 7, 1950

❄ **BOOKSHELF** for automobile steering wheels, which received a patent from the government recently, will hold an open book for leisurely reading but is probably better adapted to hold a road map at which the driver may take quick glances. It can be quickly attached or detached.

Science News Letter, October 7, 1950

❄ **BATHTUB SEAT**, with back and head rest, is an inflatable affair made of vinylite plastic with suction cups on the bottom to hold it in place. After being blown up, it



is placed in position in the tub, as shown in the picture, and the water is then turned on.

Science News Letter, October 7, 1950

❄ **PORTABLE RESPIRATOR**, for polio patients, is made of transparent plastic with a rubber sealing element attached to the shell, and is designed to cover just the

patient's chest and abdomen. Because it requires no back shield, it can be applied in half a minute.

Science News Letter, October 7, 1950

❄ **GLOVE HOLDER**, an improved device to grasp a woman's gloves and attach them to a hand bag, can also be used to hang bag and gloves to the edge of a table in a cafe. It is an ornamental metal device, with one arm of the grasper having a pivoted extension to reach over the table edge.

Science News Letter, October 7, 1950

❄ **BEDSIDE NIGHT LIGHT** is inside a box-like container which resembles a gold-tooled leather book and is designed to rest on a nearby table. When the cover is lifted, an electric bulb inside is lighted, and the contents, from handkerchiefs to sleeping tablets, become visible.

Science News Letter, October 7, 1950

❄ **INEXPENSIVE TELESCOPE** for amateur astronomers comes unassembled but is easily put together with the aid of a screwdriver. It has a compressed cardboard tube 45 inches long and four inches in inside diameter, hardwood lens fittings and a three-inch telescope mirror.

Science News Letter, October 7, 1950

Do You Know?

An eclipse of the sun was observed by Chinese in 2158 B.C.

Milk some day may be on the market as a frozen concentrate.

Persons whose blood might be needed for transfusions to others may some day bear tattoo marks to indicate their type of blood.

Tularemia, commonly called rabbit fever, is found in wild rabbits in the United States and in many parts of the world from Alaska to Turkey.

With long storage, gasoline is likely to change because it is made up of several constituents some of which are more volatile than others and may evaporate off.

Bats flying in the darkness emit ultrasonic waves, the returning echoes of which keep them from hitting obstacles; it has been known for 200 years that they do not depend on eyesight.

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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



A Bed of Stone

See Page 247

A SCIENCE SERVICE PUBLICATION

MILITARY DEFENSE

Student Deferment Fight

Hershey says that local draft boards will have to handle student deferment although top scientists hope that a deferment policy board of experts will be set up.

➤ **SELECTIVE** Service and scientists are building up for a fight over whether local draft boards shall control deferment of students and trained scientists, technicians and engineers. Recently, in reporting to a meeting in Washington of the American Council on Education on the recommendations of six advisory groups as to how to handle such deferments, Selective Service Director Lewis B. Hershey emphasized that the local boards must do the selecting and the deferring.

Most scientists, including many of the members of the six advisory committees representing most fields of learning, hope that President Truman will take such deferments out of the hands of local boards and perhaps entirely out of Selective Service discretion.

Representatives of four top scientific societies (the National Research Council, the American Chemical Society, the American Institute of Physics and the Engineers Joint Council) are preparing within two weeks to recommend to the National Security Resources Board that a separate body of experts in the fields to be deferred be set up to determine deferment policy. If this were done, Selective Service boards would be required to follow their recommendations.

This advice would make one of the main features of the report of General Hershey's advisers on how to handle college students' and scientists' deferment within the present

Selective Service law pretty much a dead letter. Now the four scientific societies, sometimes speaking through the same men, are preparing to advise NSRB to take this power away from Selective Service.

General agreement with three main points in the recommendations of the six special Selective Service committees was reached at a meeting of more than 550 distinguished educators and scientists at the American Council on Education sessions. They agreed that: 1. A nationwide aptitude test should be given to all high school seniors and that only those who passed this test should be deferred to go to college. 2. Certain percentages of sophomores, junior, senior and graduate classes in universities and colleges should also be deferred, and 3. No attempt should be made to pick out "essential" areas of study and defer students in those only, because no one knows now what will be essential to the national interest in five or ten years.

Scientists and educators are worried that the general public will feel they are seeking a sort of "draft-dodger" status for college students and scientists. They may indicate, through a resolution at the meeting, that they feel that any man who is deferred to complete his studies has an obligation to use his training in the national interest. If he doesn't go into uniform, they feel, he certainly should work on something the government considers essential.

Science News Letter, October 14, 1950

ARCHAEOLOGY

Clue to Ancient Eskimos

See Front Cover

➤ **TINY** flakes of stone about the size of a paper clip which have lain frozen in the soil of the Canadian Arctic for thousands of years are the latest clues to the lives of the most remote ancestors of Eskimos.

These flakes were chipped off stone chunks and then delicately worked to an edge by the Dorset people whom archaeologists call the "ghosts of the Arctic," because so little is known about them. They were probably the first Eskimos to reach the New World, no one knows just how many centuries before the coming of Columbus. The flakes were probably used as tiny knives or scrapers.

They were found by Dr. Henry B. Collins, Jr., of the Smithsonian Institution and William E. Taylor, of the National Museum

of Canada, digging in the icy soil of Cornwallis Island, far up in the polar regions.

The flakes, known to scientists as "Lameller" flakes, link the earliest inhabitants of far northern Canada to men who lived in Asia in Middle Stone Age or New Stone Age days.

The mystery of how the antiquity of America's Stone Age man compares with that of his Old World relatives seems about to be solved. Dr. Collins found associated with the ancient stone flakes, some particles of wood which he has brought back and will submit for study of the carbon 14 content.

Since it is now known that organic matter gives off radiation from radioactive carbon 14 which disintegrates at a regular rate, the age of wood, bones, horns, skin and other once living matter can therefore

be determined by the proportion of carbon 14 remaining in the specimen.

"This method of dating," Dr. Collins commented, "is push-button archaeology. It is as simple as having a roll of film developed."

The new discoveries supplement those made by Dr. Collins in the same region last year in a joint expedition for the National Museum of Canada and the Smithsonian. Then it was found that the Thule Eskimos who preceded the modern Eskimos once lived on Cornwallis Island, built houses of wood and stone supported by whale bones, and hunted whales. Life there is too rugged for the Eskimos nowadays; there are no whales, neither is there driftwood.

The photo on this week's cover of *SCIENCE NEWS LETTER* shows remains of Thule living quarters. Notice the stone bed in right foreground. The "veiled ladies" are whale bone roof supports.

Science News Letter, October 14, 1950

ICHTHYOLOGY

"Red Tides" Do Suffocate, Do Not Poison, Fish

➤ **"RED TIDES,"** mysterious waves of evil-smelling, blood-red death which periodically sweep U. S. coastal areas clean of all marine life, apparently kill fish by suffocation rather than poisoning, two University of Texas biologists report.

"Red tides" are known to be caused by sudden multiplication of red-colored, one-celled organisms called protozoa, which are near the bottom of the evolutionary scale. But why they multiply so suddenly, and how the organisms kill fish, are still puzzles to scientists.

Drs. Cecil H. Connell and Joy Baines Cross have found that a Galveston "red tide" in 1949 occurred in a bayou that was slightly polluted by sewage. The multiplying organisms caused "extraordinarily wide and rapid" changes in the amount of oxygen in the water.

Fish did not die in the "red water," they say, but rather died after the redness had settled, leaving the water turbid and milky and nearly devoid of dissolved oxygen.

The Galveston "red tide" marked an eastward move by a villain known as *Gonyaulax*, belonging to the order dinoflagellates. Previously this tiny marine creature had caused wide-spread losses of fish along the Pacific Coast.

One type of *Gonyaulax* is known to be the cause also of disastrous human poisoning, carried by polluted mussels. This type manufactures a poison 10 times as deadly to mice as strychnine. But the poison has little effect on fish, and does not explain the mass destruction of the "red tides," scientists say.

Science News Letter, October 14, 1950

More than half the 8,500 homicide cases annually in the United States are killed by gunfire.

ARCHAEOLOGY-NUCLEAR PHYSICS

New Age for American Man

A radiocarbon calendar for the past 20,000 years devised by Libby and Arnold shows by the dating of woven rope sandals the oldest evidence for man in America.

► WOVEN rope sandals found in a lava-covered Oregon cave become the oldest articles associated with man in the Americas as the result of the radiocarbon atomic calendar presented to National Academy of Sciences recently by Dr. Willard F. Libby and Dr. James R. Arnold of the University of Chicago's Institute of Nuclear Studies.

These sandals are approximately 9,000 years old. The ancient Americans who wove them and wore them become the oldest proved inhabitants of this continent, dating back to 7000 B.C. This probably antedates the oldest agricultural village in Iraq, which the radiocarbon dating of shells found there, also reported, show to be at least of the period 5000 B.C.

The greatest upset in American antiquity resulting from the radiocarbon dating is in the age of charcoal from a fire-pit presumably associated with Folsom man, to whom ages of from 10,000 to 20,000 years had been assigned. Dr. Libby's very sensitive Geiger-type counter showed the "surprisingly young" average age of about 4,300 years.

This makes the Folsom inhabitants actually more recent than people who built fires in Frontenac and Lamoka regions of New York State about 5,000 years ago, by the radiocarbon dating. The oldest Indian mounds in Kentucky have about this same age, as shown by analysis of shells and deer antlers. These are the oldest evidence of human beings in eastern America.

The method of radiocarbon dating is based upon the determination of the amount of radiocarbon or carbon 14 in the organic material being tested. This radioactive carbon is created in the upper atmosphere when cosmic rays strike the hearts or nuclei of nitrogen atoms. Some of this carbon reaches earth and is absorbed through food and water by plants and animals during their lifetime.

The radioactivity is lost at a constant rate, half of it disappearing in 5,568 years with a possible error of 30 years in this half-life of C 14. The amount of radiocarbon in the organic remains thus provides an index to the date that they were formed. The method is accurate to within approximately a hundred years. All but a minute amount of radiocarbon is gone after 25,000 years and the Libby method can not date objects beyond that span.

Some 300 organic objects were selected about a year and a half ago by a committee of experts as most significant for dating and Dr. Libby reports now on 159 of these.

In each case a minimum of an ounce of material is necessary. Refined methods of chemical separation are needed to obtain the radiocarbon which is counted over a period of 48 hours.

The Ice Age of the U. S. Middle West was more recent than generally estimated by geologists. Instead of being 20,000 years ago, the radiocarbon evidence shows that it was 12,000 years ago. The glacial epoch was apparently contemporaneous in Europe, for samples from Ireland, England and Germany agree closely with the Wisconsin dating of the final phase of the ice cap.

Man's first proven existence in North America was 10,000 years ago, shortly after the glaciers receded. These first known humans were in Oregon and Nevada, and there is no evidence of man on the east coast until 5,000 years later.

The giant sloth lived in Gypsum Cave, Las Vegas, Nev., about 10,500 years ago, as analysis of its dung shows. Presumably man there was contemporaneous.

A fishweir unearthed three years ago in Boylston Street, Boston, is believed to be about 5,000 years old, contemporaneous with the record-age discoveries in New York State and Kentucky, judging by analyses of the peat underlying and the wood overlying it.

Wood from Egyptian tombs, a funeral ship and a mummy case gave age figures in general agreement with the dates from the historical records 2,000 to 4,000 years ago. Other tests show that in 4,000 B.C. Egypt had a simple village and agricultural culture. By 3,000 B.C. it had its first dynasty and only 300 years later the first pyramid building began.

Mexico was inhabited at least 7,000 years ago by people who produced crude carvings. The famous Pyramid of the Sun near Mexico City is dated by Dr. Libby at 300 B.C. The temples of Monte Alban at Oaxaca in southern Mexico are dated to 600 B.C.

Burned bones of giant sloths, horses and the camel-like guanaco which were associated with human bones and artifacts in Chile at the tip of South America were dated as about 8,500 years old. These are the most ancient of the human samples from South America and contemporaneous with the Gypsum cave culture in North America.

Crater Lake in Oregon is dated as 6,500 years ago by an analysis of remains of trees killed by flowing lava from the volcanic explosion that created it.



SMOG SAMPLER—The improved electrostatic sampler is used to trap all types of dusts, fumes and smoke in atmosphere. The instrument will be an important tool for investigation of air pollution causes by health officials and industrial hygienists. (See Next Page.)

Charcoal from the famous Lascaux cave in the Dordogne, France, which has remarkable paintings made by early man in Europe is dated as about 15,000 years old.

All of Dr. Libby's dates are given in

detail with the findings of individual samples and their averages, each with a probable error that runs several hundred years in most cases.

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CHEMISTRY

Cheaper Sulfuric Acid

➤ AN EASIER, cheaper way of making sulfuric acid, extensively used in vast quantities for many industrial processes, is promised by a new method revealed in New York by the Chemical Construction Corporation.

Some 10,000,000 tons of the acid are used each year in the United States. The fertilizer industry is the largest consumer but hundreds of other manufacturing processes are dependent upon it. Sulfuric acid is a very active chemical compound composed of sulfur, hydrogen and oxygen.

The new way to make this acid is said by the developers to eliminate seven major items of equipment used in present processes. The new design is much simpler than the conventional contact process and represents a saving of about 25% of the present capital cost of an erected, medium-sized acid plant in this country.

In the manufacture of sulfuric acid, sulfur dioxide, obtained by the combustion of sulfur or roasting a sulfide, is converted into sulfur trioxide. A catalyst is used to aid the chemical reaction. The catalytic oxidation in the new process is carried out in four successive stages. Temperature control is effected by admitting cold air between these stages.

Sulfur trioxide absorbed in and chemically united with water becomes sulfuric acid. At one stage in the new process the sulfur compound is in the form of a fine mist. This is used to enrich weak acid in a venturi tube. Turbulent currents in the mist mix the materials and hurry their combination. Large amounts of heat given

off by the combining chemicals evaporate the excess water. Acid up to 95% strength can be achieved economically by the new method.

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CHEMISTRY

Collector Determines Air Pollution

➤ DANGEROUS substances in the air, such as those sometimes found near certain manufacturing plants, can be easily collected for analysis with a new device developed in Pittsburgh by Mine Safety Appliances Company. It is usable also in mines and highway tunnels where air pollution often exists.

It is a timely development now that the public is awakened to the dangers that may come from air pollution from modern manufacturing methods. The smog tragedy at Donora, Pa., which took 21 lives, greatly hurried this awakening. Among the first users of this new sampling equipment were the men of the U. S. Public Health Service who reported their investigations of the Donora air conditions a year ago.

This device utilizes what scientists know as electrostatic precipitation. Air passing through a sampling tube is bombarded by electrons from an ionizing electrode. All particles in the air are given a negative electric charge by the electrons. Then they are attracted to a positively grounded aluminum collecting tube. In the laboratory the particles are removed and analyzed.

The sampling head of this equipment, weighing only four pounds, is self-contained and resembles a small hair-dryer. In the head is a blower that provides a constant flow of three cubic feet of air per minute. The head also contains the ionizing electrode and the aluminum collecting tube which fits around the electrode. Power is by cable from an electric outlet or portable generator. The current is rectified through a voltage doubling circuit using two electronic tubes.

Science News Letter, October 14, 1950

SCIENCE NEWS LETTER

VOL. 58 OCTOBER 14, 1950 No. 16

43,800 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W. Washington 6, D. C., North 2255. Edited by WATSON DAVIS.

Subscription rates 1 yr., \$5.50, 2 yrs., \$10.00, 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address. Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R. 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to periodical literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STAt 4439

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

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Photographs: Cover, Dr. Henry B. Collins; p. 247, Dr. A. von Hippel; p. 250, Atomic Energy Commission; p. 251, American Red Cross.



WET SMEAR CANCER DETECTION TEST—Gastric fluid is extracted for later analysis by the smear technique. On the right, technicians fix and stain the smear slides while Dr. Papanicolaou who devised the technique watches.

MEDICINE

Cancer Prevention by Test

Dr. George N. Papanicolaou received a 1950 Lasker award for his diagnostic test for cancer. Cancers of internal organs may be diagnosed by this test.

➤ MORE practical cancer prevention is foreseen as a result of the famous Papanicolaou cancer diagnostic test for which its discoverer, Dr. George N. Papanicolaou of Cornell University Medical College, received one of the 1950 \$1000 Lasker Awards of the American Public Health Association.

Dr. George Wells Beadle, professor of biology and chairman of the biology division, California Institute of Technology, and Dr. Eugene Lindsay Bishop, director of health and safety for the Tennessee Valley Authority, also each received one of the awards. The group award was conferred on the International Health Division of the Rockefeller Foundation.

The Papanicolaou cancer diagnostic test depends on the fact that cancers of internal organs and body structures such as the uterus, urinary tract, stomach and lungs shed superficial cells which can be obtained for examination almost as easily as if the cancers were located on the outside of the body.

Valuable as the test is now for diagnostic purposes, it is considered to have even greater potential value for the future.

"It seems not impossible that repeated observations using this cytological (cell study) method will reveal the earliest changes of cancer," is the opinion embodied in the Award citation.

When the changes in cells revealed by

the test can be regularly shown, scientists think they may have an index to the effectiveness of methods designed to restore pre-cancer cells to normal.

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AERONAUTICS

International Air Trip Delays To Be Eliminated

➤ MANY of the recommendations of the International Civil Aviation Organization designed to reduce or eliminate obstacles and delays in international air travel are proving effective in the United States, the Civil Aeronautics Administration revealed in Washington.

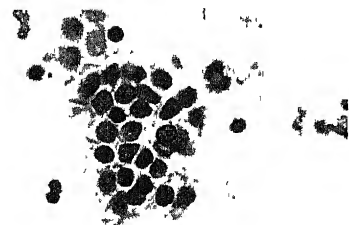
The international body, which includes representatives of more than 50 nations, has been for several years studying possible ways for cutting out red tape and other obstacles which delay the passage of travelers, mail and cargo on international routes.

To implement the work of the international group and make aviation-promotion recommendations of its own, an American committee was appointed by CAA in 1945. It consists of representatives of 10 government agencies and two air transport associations. It is known as the Subcommittee on Facilitation of International Civil Aviation, and is dubbed FAL for short.

A report of this committee reveals that solid accomplishments in reducing or eliminating obstacles and delays in international air travel were made during the past fiscal year. The committee report lists 29 accomplishments in facilitating air travel and movements of aircraft and goods across United States borders.

The greatest single accomplishment, according to the report, has been the approval and almost complete implementation of recommendations of the international group relative to national boundary-crossing obstacles.

Examples of smoothing the way for travelers in international air travel include



Non-Cancerous Cells



Cancerous Cells

the elimination of transit visas for persons who are in continuous transit across the United States from one country to another. Also important is elimination of the necessity of obtaining a CAA permit for con-

duct of private flights or flights not in furtherance of a business involving the carriage of mail, persons or cargo into the United States.

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PUBLIC HEALTH

Polio Study in Paulding

➤ A TEAM of over 25 polio fighters and public health experts gathered from all parts of the nation, moved into Paulding, Ohio, recently to begin what is considered a unique study of a rural poliomyelitis epidemic.

Thus, the scientists hope to learn more about how polio is spread and why it behaves as it does.

Paulding County, the field of their investigation, has been threatened with becoming a second Wytheville, Va., with 32 reported cases and four deaths from polio since the first of August. With a population of about 15,000, the county has an epidemic rate of more than 200 cases per 100,000 population. Authorities consider 40 cases per 100,000 to be a major epidemic.

"This epidemic is in some ways similar to Wytheville's but apparently not as severe," said Dr. C. R. Freeble, chief of the Ohio Health Department's communicable disease division, on his arrival in Paulding.

The special research team will work under Dr. Freeble's direction. It was gathered at the request of Dr. John D. Porterfield, director of the Ohio Department of Health. About 15 of the experts are being furnished by the Communicable Disease Center, U. S. Public Health Service. Dr. R. A. Vonderlehr, medical director in charge of the center, said that scientists have been sent from Atlanta, Montgomery, Ala., Charleston, W. Va., and other points. The others of the team are state health department personnel.

Dr. Ralph S. Paffenbarger, Communicable Disease Center epidemiologist, is

field director of the epidemic team. Working under him are physicians, statisticians, nurses, engineers, entomologists, veterinarians and laboratory authorities on virus disease.

"From our past experience we know that there are no steps we can take now to arrest the progress of the epidemic," Dr. Paffenbarger said. "We do, however, want to make a thorough study in the hope that some clue will be uncovered which will make it possible in future to stop such epidemics. At the same time we also want to provide such immediate aid as the community needs."

Here is how the research team will work: Medical epidemiologists will investigate all the circumstances surrounding the occurrence of each paralytic case and conduct other research.

Statisticians will make door-to-door surveys to measure the incidence of paralytic disease against that of other diseases which might be so-called "hidden," or unrecognized, polio.

Laboratory physicians will collect virus samples for study.

Engineers will conduct an environmental survey, studying all the factors in the environment which might bear on the polio incidence. These might include food, water, milk and sewage.

Entomologists will check the insect population and collect specimens.

A veterinarian will study the diseases of animals which might, in some way, be related to the human poliomyelitis.

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PSYCHIATRY

Factors in Breakdown

➤ ENVIRONMENT is in most cases more important than heredity in determining breakdown under strain, it appears from studies with animals at the behavior division of the Roscoe B. Jackson Memorial Laboratory in Bar Harbor, Me.

In an individual case, however, the reverse may be true. Minor differences in heredity may make very great differences when animals are placed in a stress situation serious enough to produce breakdowns in some animals. Under ordinary conditions the hereditary difference may be unimportant, but in a stress situation it makes

the difference between breakdown and no breakdown for the individual.

The time when any social relationship begins is very important from the standpoint of preventing breakdowns and fostering good mental health, the scientists suspect from their studies.

The reason is that learning which takes place at that time may determine the nature of future relationships. For dogs the most important critical period takes place from about three to six weeks of age. Puppies which have their tails cut off at one week of age, for example, show no difference in

behavior from normal littermates. But a grown dog that had to be assisted in the delivery of her puppies, during which considerable unavoidable pain was caused, cannot be picked up by the person who assisted at delivery without yelping as if in pain.

While social factors, or environment, in many cases produce the stress that leads to breakdown, the nature of social adjustment patterns is itself in part determined by heredity and thus in part influences the likelihood of stress.

A factor which causes stress in one kind of animal may not do so in another, the scientists found. Dogs are badly upset by isolation, but mice are much less troubled by it. Within a single species, however, some dogs adjust themselves well to confinement whereas others cannot sit still even for short periods.

Details of the studies are reported by Dr. J. Paul Scott, director of the Jackson Laboratory's behavior division, to the Association for Nervous and Mental Disease.

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VETERINARY MEDICINE

Radioactive Eggs Trace Growth of Chickens

➤ RADIOACTIVE tracers from Oak Ridge are enabling veterinary scientists to follow, step by step, the growth of a chicken from an egg.

Radioisotopes of phosphorus, calcium, potassium, sodium, iodine, sulfur, iron, manganese, cobalt, zinc and carbon are now being used in poultry studies, Drs. C. L. Comar of Oak Ridge and O. E. Goff of Knoxville, Tenn., told the American Veterinary Medical Association in Miami Beach, Fla.

"Hot" phosphorus, for example, is tracing the formation of egg yolk and the development of chicken embryos, and helping scientists tag invisible viruses in infected eggs. Calcium and phosphorus isotopes trace the way a chicken utilizes those elements from its feed. Radioactive iodine is aiding studies of the thyroid gland in poultry.

Meanwhile, a committee of the AVMA has tackled the monumental task of putting all the diseases of animals into a single nomenclature. No one knows exactly how many animal ailments there are, but the AVMA's aim is to standardize disease classification according to origin and thus eliminate the use of several names for the same disease.

A new blood serum test for spotting distemper in foxes was reported by Drs. M. Savan and C. A. Brandy of the University of Wisconsin. They said the disease is now causing serious losses on American fur farms. In the new test, blood from a fox is mixed with a special virus preparation. If the animal is infected, a characteristic reaction takes place.

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GENERAL SCIENCE

Search for Science Talent

The national search for students possessing scientific ability is entering its tenth year. The present Korean situation points up the need for such talent.

➤ A NATIONWIDE search for boys and girls with research ability in science started Sept 28

High school seniors in 27,000 public, private and parochial schools in continental USA were invited to enter the Tenth Annual Science Talent Search and compete for \$11,000 in Westinghouse Science Scholarships to continue their education in science. In announcing the Science Talent Search for the tenth consecutive time, Watson Davis, director of Science Service, which conducts the search through Science Clubs of America, called the attention of school administrators to the need for more people trained in science.

"The present Korean situation," Mr Davis said, "points up the urgency of keeping our scientific resources constantly replenished so our country will be in a state of readiness to move forward in war or peace. The greatest resource is the talent of our boys and girls. It must be recognized and cultivated wherever it can be found."

Principals and science teachers in secondary schools throughout the country are now receiving instructions on "How To Search for Science Talent." They will learn how to recognize science talent among their students and encourage those boys and girls to enter the Tenth Annual Science Talent Search.

They will send for and after Nov. 15 receive about 14,000 sets of entry materials so their qualifying seniors can enter the competition for \$11,000 in scholarships. Thousands of seniors will comply with all requirements for entry right in their own schools.

From the 14,000 entries it is estimated about 3,500 will complete all entry requirements. Of these, 40 will be named as national winners and will receive 5-day, all-expenses-paid trips to Washington, D. C., to attend the Annual Science Talent Institute.

Another 260 will be named for honorable mention. All 300 will be recommended to colleges, universities and technical schools of their own choice. As in the past, it is expected many will receive offers of financial assistance for college educations from other sources on the basis of this honor.

To comply with entry rules each contestant must take a three-hour science aptitude examination in his own school, submit personal and scholastic records and write a report of about 1,000 words on "My Scientific Project." The examination may be taken anytime from Dec. 11 through Dec. 16.

All entries must be in the offices of Science Clubs of America by midnight, Wednesday, Dec 27, when the competition closes.

Winners and honorable mentions will be announced late in January, 1951, and the 40 winners will come to Washington, D. C., in March, 1951. After five days of meeting the nation's outstanding scientists, of learning about the latest developments in science and of visiting places of historic and scientific interest, the winners will receive scholarships ranging in size from \$100 to \$2,800.

Through the nine years of its existence the Annual Science Talent Search has located 360 winners and 2,340 honorable mentions. These young people are now making their mark in scientific circles. Many of them already have from one to four degrees in science and are active as chemists, physicists, doctors, mathematicians, engineers, biologists, astronomers and in many other fields of science. Some have made important contributions to their fields of study and others are well along in their preparation to do so.

The objectives of the Science Talent Search are:

1. To discover and foster the education of boys and girls whose scientific skill, talent and ability indicate potential creative originality and warrant scholarships for their development.

2. To focus the attention of large numbers of scientifically gifted youths on the need for perfecting scientific and research skill and knowledge so that they can increase their capacities for contributing to the rehabilitation of a war-dislocated world and to help the United States, with the aid of science, to lead the world to permanent peace.

3. To help make the American public aware of the varied and vital role science plays in world affairs and in raising the standard of living.

High school seniors in some states will have a double chance to win scholarships through state Science Talent Searches run concurrently with the national competition and by special arrangement with Science Clubs of America.

In 1951 the following states will hold these competitions: Connecticut, District of Columbia, Georgia, Illinois, Indiana, Iowa, Kansas, Louisiana, Maine, Massachusetts, Minnesota, Montana, New Hampshire, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, West Virginia and Wisconsin.

The Science Talent Search is conducted annually by Science Clubs of America, administered by Science Service. It is made financially possible by the Westinghouse Educational Foundation of the Westinghouse Electric Corporation.

For complete details of the Science Talent Search write to Science Clubs of America, 1719 N St., N. W., Washington 6, D. C.

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ICHTHYOLOGY

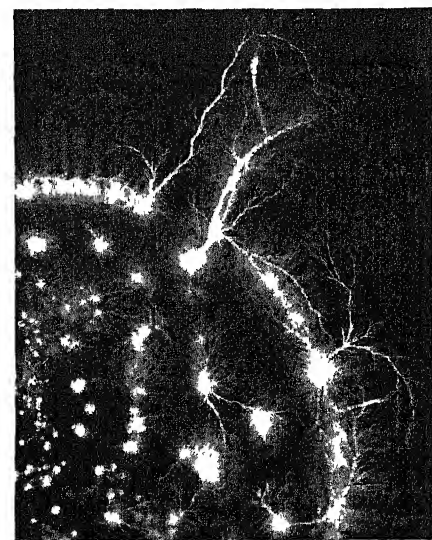
Lime in Lake Gives More, Better Trout and Bass

➤ FROM stunted bullheads and undersized panfish to shining lake trout and fresh water bass is the transformation wrought by two Wisconsin scientists who sowed ordinary lime in small, swamp-surrounded bog lakes.

Drs. Arthur D. Hasler and Oscar M. Brynildson of the University of Wisconsin found they could change the chemical character of lake water—and enable more and better fish to live in it—by treating certain lakes in the same way farmers fertilize their soil, using lime to combat acidity.

The zoologists found lime reduced the brown, acid discoloration of water in swamp-fed lakes. Sunlight could then penetrate and more plants would grow on the bottom, thereby increasing the oxygen content of the water. Presto, trout and bass could live in the lakes, where before there had not been enough air for these fighting fish.

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ELECTRONS MULTIPLY — The photograph portrays the breakdown of nitrogen gas under a high transient electric voltage. From pictures of this type, scientists are learning more about the detailed mechanisms by which electrons and ions destroy insulating materials.

MEDICINE

Patient Survives Removal Of Both Adrenal Glands

➤ A CASE in which both vital, cortisone-producing adrenal glands have been removed from a patient with high blood pressure and diabetes is reported by Drs. D. M. Green of Chicago, J. N. Nelson and G. A. Dodds of Seattle and R. E. Smalley of Billings, Mont., in the *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* (Oct. 7).

The patient is a young married woman who developed diabetes at the age of six and high blood pressure at the age of 20, eight years before the operation. The high blood pressure condition was severe and getting worse. For two years before the operation she had attacks of headache, intense nervousness, flushing of the face and blindness. Her ankles were swollen, she had trouble breathing and pain around her heart. Her kidneys also were affected. Because of the severity of her condition and the evidence from scientific research that abnormal adrenal gland function plays a part in high blood pressure, and even in diabetes, the patient, her husband and the doctors decided to undertake the drastic operation.

When seen nine and 15 months after the operation her heart and blood pressure were normal, she could read without eyeglasses, the kidney disease had been arrested and the diabetes was markedly improved. She still had to take insulin, however.

Her skin had darkened because of the Addison's disease produced by removal of the two adrenal glands. This disease which used to be invariably fatal was kept under control by use of adrenal gland hormones.

The doctors reporting the case do not recommend removal of both adrenal glands as a treatment for either malignant high blood pressure or diabetes. But they point out that this operation in a limited number of otherwise hopeless cases might lead to better understanding of the two diseases and to their treatment by chemical blocking agents.

Science News Letter, October 14, 1950

CHEMISTRY

Garbage-Filled Gravel Pits Goal of English

➤ ABANDONED quarries and flooded gravel pits which pockmark the English countryside are being turned back into level usable farmland, filled with England's garbage.

This would be a simple process but for one major—and literal—headache, the foul-smelling, paint-blackening gas called hydrogen sulfide. When garbage decays, particularly in water, the living organisms which break it down release great quantities of hydrogen sulfide, much to the displeasure of any one living downwind.

The British Department of Scientific and Industrial Research has begun a series of experiments, however, using the clinker ash from incinerators, acid and types of bacteria to eliminate production of this gas from underwater garbage dumps.

One method is to divide a large sinkhole into smaller lagoons with dikes built of the inert clinker. Putrescent refuse is then dumped into each lagoon so quickly that it is filled before the gas nuisance can develop. If some gas is put off, acid is added to the water to prevent further growth of the decay bacteria.

Other types of bacteria are also being tested as possible ways to eat up the hydrogen sulfide as fast as it is produced. If they prove feasible, this new form of bacteriological warfare may help to solve England's serious shortage of garbage disposal space and give the British more land for housing or agriculture.

Science News Letter, October 14, 1950

PHYSICS

Measure Velocity of Water By Sound Waves

➤ THE velocity of water in the discharge from turbines in hydroelectric plants may be measured by passing sound waves in the ultrasonic region through the water, the American Institute of Electrical Engineers was told in Baltimore.

The method of using ultrasonics for this purpose was described by W. B. Hess and S. K. Waldorf of Safe Harbor, Pa., Water and Power Corporation, and R. C. Swengel of York, Pa. They presented the results of tests made with a small duct, five by nine inches in cross section, with water velocities up to six feet per second.

The ultrasonic method, they declared, appears to have distinct advantages over existing methods of measuring the discharge of turbines in large hydroelectric stations. In carrying the method to the present state of development a great many difficulties have been overcome. It now appears that remaining difficulties may be overcome and the method applied to large scale measurements.

This method of using sound waves too high-pitched to be recognized by the human ear consists essentially of calculating water velocity from the measured phase angle between the transmitted ultrasonic signal and the signal received after passing through the body of moving water, they stated.

Instruments to pick up the sound waves after they passed through the water were placed on the wall of the water duct opposite the transmitter and "displaced some definite distance along the principal axis of flow." From this the phase angle was determined. Errors of less than two percent were obtained in measurements in the test duct.

Science News Letter, October 14, 1950

VETERINARY MEDICINE

Find Cocker Spaniel With "Blue Baby" Heart

➤ A COCKER spaniel with the rare condition called a "blue baby" heart is reported by doctors at the State College of Washington in Pullman, Wash.

The dog had difficulty in breathing. When it became excited, it would faint. Its skin had a bluish tinge. In human beings, these signs would indicate one of several defects of the heart which have come to be labeled "blue baby" conditions.

The veterinarians found that a duct between two chambers of the spaniel's heart, which should have closed soon after birth, had remained open. Blood which normally would have passed through the lungs before going to the body by-passed the lungs through this opening, and the body was robbed of vital oxygen in the bloodstream.

As in humans, such congenital heart conditions in animals are quite rare, the veterinarians said. Several cases in cattle were also reported, but from 2,000 post-mortem examinations at the Washington veterinary medical school, only six serious heart irregularities were discovered.

Science News Letter, October 14, 1950

ICHTHYOLOGY

Find 79 New Varieties Of Fish at Bikini Atoll

➤ SMITHSONIAN Institution scientists revealed that at least 79 new types of fish were discovered at Bikini Atoll before and after A-bomb tests in 1946.

Dr. Leonard P. Schultz said atomic radiation had nothing to do with the sudden appearance of so many new varieties, although some of the preserved fishes brought back from Bikini remained radioactive for as long as a year.

The tremendous scientific project known as Operation Crossroads made Bikini and its surrounding waters the most studied island in the Pacific, Dr. Schultz said. For scientists in all fields, the summer-long sojourn on the lonely atoll was a windfall.

The work of sorting and identifying the Smithsonian fish collection is still far from complete. A total of 481 different species have been distinguished so far.

Some of the fish are fantastic in appearance. One of the smallest fish in the world, a coral-dweller little more than half an inch long, was found. The Smithsonian also got a giant puffer, a cardinal fish with a belly stripe that lights in the dark, and flatheads which were ostriches in reverse—they lived completely covered by sand except for their mouths.

Science News Letter, October 14, 1950

E FIELDS

MEDICINE

Standardization of Test Tube Dads Urged

➤ MORE care and standardization in selection of test tube fathers is urged by Dr. Murray Russell of Beverly Hills, Calif., in a report to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Oct 7) in Chicago, Ill.

The demand for artificial insemination is increasing, he points out. War injuries which have increased the ranks of relatively and absolutely infertile men constitute part of the reason for the increased requests. Physicians are getting for this procedure. Difficulties and objections to adoption also account for the increase.

"In the past it was not uncommon," Dr. Russell points out, "for a donor to be chosen at random from among university students or hospital interns. He was, and still may be, approached at the last moment for the donation without examination, blood studies or determination of his fertility."

"Many so chosen were never fathers. This haphazard choosing oftentimes ended in failure of insemination with loss of valuable time, money and effort. It was fraught, also, with risk to the potential mother of transmission of venereal or hereditary diseases and incompatibilities of blood types."

Items which Dr. Russell says should be checked in selecting donors are: complexion, height, weight, color of eyes and hair, schooling, intellectual background, religion, family background, presence or absence of such diseases as asthma, diabetes and allergies, frequency of twins and triplets in the donor's family, complete medical and venereal history, number of children sired and their state of health, occurrence of premature births, stillbirths and miscarriages of the donor's natural wife, urinalysis, serologic tests, Rh blood typing and semen analysis.

Science News Letter, October 14, 1950

ENGINEERING

Brains Aid Cancer Detection Test Search

➤ ELECTRONIC calculating machines are helping in the search for early cancer detection tests, Dr. Gilbert W. King of Arthur D. Little, Inc., Cambridge, Mass., chemical engineering firm, reported in Endicott, N. Y.

The punch card machines are used to compare spectrum patterns of abnormal chemicals in urine which might give clues to the presence of cancer. Physicians at Massachusetts General Hospital in Boston have accumulated such patterns for nearly 500 substances that may be significant in

spotting early cancer. But comparing and matching patterns by ordinary methods may take as long as a week. The punch card method completes the job in a few minutes, which is more than 350 times faster than conventional methods.

Dr. King gave details of the punch card method at a special seminar on industrial computation sponsored by the International Business Machines Corporation.

Science News Letter, October 14, 1950

SAFETY

One Hundred Million in Critical A-Bomb Areas

➤ ONE hundred million Americans live within "critical target areas" which are likely to be attacked by A-bombs should an all out war come, the National Security Resources Board in Washington, D. C., warns.

The NSRB's Office of Civil Defense sent to all state governors copies of maps indicating the critical target areas within their cities and suggesting that they immediately begin planning the civil defense of those areas.

Plans, a booklet accompanying the maps said, should be based on areas of mutual aid and mobile support. The other 50,000,000 Americans, according to the booklet, are expected to supply aid and support to critical target areas in their vicinity.

Three kinds of critical targets are indicated: Type I, industrial-metropolitan areas; Type II, industrial areas; and Type III, metropolitan areas. Some critical target areas are so secret that they are not indicated on the maps, although the booklet assumes the governors concerned will know about them and plan accordingly.

Science News Letter, October 14, 1950

MEDICINE

Obesity Considered As Disease

➤ OBESITY, or overweight, "should be regarded as a disease," states the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Oct. 7).

"Of immediate importance in the control of arteriosclerosis (hardening of the arteries) is the need for curbing obesity," the editorial states.

Research implicating the fatty substance, cholesterol, in the cause of artery hardening needs to be continued. But, the editorial warns, "it seems unwise" to ban from the diet foods containing cholesterol if there is risk of sacrificing nourishing qualities unless there is clearcut evidence for the beneficial effect on the artery condition.

Physicians are warned against misleading advertising claims proposing other substances as substitutes for the cholesterol-containing foods.

Science News Letter, October 14, 1950

ENGINEERING

Tarred Roads No Longer Hazard in Rainy Weather

➤ BRITISH scientists, by a new treatment for crushed stone, have ended the ruin a heavy rainfall can cause to a freshly-tarred road.

Many asphalt roads are maintained by spraying a film of tar on the road surface and covering the film with crushed stone. If it rains too soon, the wet stone will not stick to the tar. Traffic scatters the stone, and the dressing has to be done all over again.

A coating of creosote, mixed with a chemical wetting agent and applied to the stone, has been found to keep out the water. The result, tested on roads in many parts of England, is that the stone sticks to the road no matter how hard or how soon it rains after the dressing has been applied.

The new treatment, though it adds an initial expense, will save thousands of dollars by eliminating waste in highway maintenance.

Science News Letter, October 14, 1950

ENGINEERING

Robot-Controlled Tools "Plan" Like Human Beings

➤ ROBOT-controlled machine tools, automatic pilots for airplanes and the giant new mechanical computers have reached a point where they now "plan" and "act" along lines of human reasoning.

The vacuum tubes in a modern electronic amplifier affect each other much as do people who work together, Herbert K. Weiss, an Army ballistics research scientist, said in New York in a lecture sponsored by the American Institute of Electrical Engineers.

The basic principle of the new machines is "feedback control," Mr. Weiss said. Such systems give a machine a built-in plan of action. They compare the machine's progress with the desired objective, and if there is any discrepancy, adjust the machine automatically to correct the situation.

But these near-human powers are not enough. The design of feedback systems has advanced so much that machines actually have critical judgment, the Army scientist stated.

Such an electronics system, he said, may have to examine its sources of information with a sharp eye, separating true information from false and acting only on data which it, the machine, concludes is reliable.

Mr. Weiss, who works at the Army Ordnance ballistics research laboratory at the Aberdeen, Md., Proving Ground, said such powers are really very simple. They have been developed, he said, through use of basic principles in mechanical, electrical and communication engineering, probability theory and "operational mathematics."

Science News Letter, October 14, 1950

MEDICINE

New Hope for the Burned

Relief for burns has top medical research priority. For the first aider the rule is to relieve pain, prevent infection and treat shock.

By JANE STAFFORD

Third in a series of atomic bomb first aid

➤ BURNS and how to cure them are today's hottest medical problem, thanks to the danger of A-bomb radiation added to the more peaceful accidents such as smoking in bed.

The best cure for burns is to prevent them. But if you are burned badly, the chances are you will get the best treatment the world has ever been able to give to burns.

Ugly, dangerous burns with the flesh literally cooked and charred and the skin totally destroyed are called third degree burns. The sign of a second degree burn is the blister, though you cannot always tell by this sign immediately, because the blisters may not form until hours or even a day later.

First Degree Burns

The first degree burn, unlike murder, is the least serious. The reddened skin of a mild wind or sunburn is an example of a first degree burn. The damage is confined to the most superficial layers of the skin which may "peel" in small powdery flakes. If you blistered after that day at the beach, however, you had a second degree burn. How sick you were depended on how much of your skin got that seriously burned.

The amount of body surface burned as well as the degree of the burn plays a part in the severity of the burn. Up to the time of the second World War, first degree burns involving two-thirds of the body surface and, in adults, second-degree burns involving one-third of the body surface were generally fatal. But in 1945 a Navy surgeon could report the recovery and return to duty within three months of a young Marine who had second and third degree burns over 83% of his body.

To get such results requires practically the whole armory of medical weapons from gauze to steaks and the surgeon's skin grafting instruments. And it requires also a corps of trained medical personnel.

Discovery of the sulfa drugs and then of penicillin and other antibiotics has greatly aided the victims of severe burns. Infection has long been a major problem in burns, particularly those occurring in disasters in which the victims may have other wounds besides the burn. In the event of an atomic disaster, the infection prob-

lem is greater because radiation from the bomb reduces resistance to infection.

Medical scientists have not yet agreed on the best method of fighting infection in burns. Some believe that sulfa drugs or penicillin should be put directly onto the burn, usually in the form of an ointment, when the first dressing is put on.

Others think it better to put nothing on the burn itself except a sterile dressing or a sterile dressing impregnated with petrolatum. This group thinks the penicillin or other anti-infection drug should be given by hypodermic injection, as in the case of pneumonia or other infection, to be carried to the burned area and all other parts of the body by the blood stream. But, says the other side, this method of giving penicillin requires more trained personnel to give the hypodermic injections.

Both sides agree that when there are other wounds besides burns, as there are likely to be in case of an atomic or other great disaster, "shots" of penicillin would have to be given.

The solution may come, at least for atomic bomb burn victims, through aureomycin or some other antibiotic which is effective when given by mouth in pills or capsules.

Exposure Treatment

One of the methods of treating burns now under trial in a couple of burn research centers is the "exposure method." With this method nothing is put on the burn. It is left completely exposed to the air, but the burned part is immobilized in some way. Good healing of superficial burns, without infection in one to four weeks, has been reported with this method. Penicillin "shots" are given the patient as part of the treatment. How well this method works with deep burns that extend through all layers of skin and sub-skin tissue remains to be seen.

Direct opposite of the exposure method is the pressure dressing which came into use during World War II and has continued in use since then. These are large pads of absorbent, resilient material bandaged on tightly and left in place for a week or 10 days. With this dressing pain is greatly relieved and almost all superficial burns, mild or deep, heal in one to four weeks if infection does not develop.

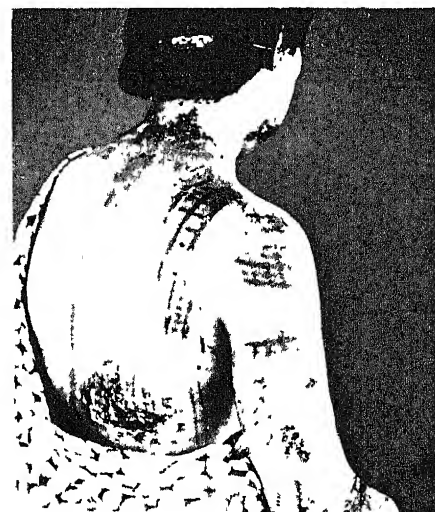
Nylon is also on trial as a burn dressing. English doctors have been trying nylon bags to cover burned hands and pieces of nylon to cover other burned areas.

Flash burns, such as come in atomic attacks, and also in explosions, are superficial but extremely painful. Small doses of morphine or codeine do a good job of relieving pain in superficial burns, and even in deep burns, especially when the burn is covered. The covering of the burn alone does much to relieve pain and this is one reason medical scientists have been working hard to find good simple ways of covering burns without contaminating them for use in large scale disasters.

Morphine's Second Role

Morphine, however, may turn out to have another important value in treatment of burns besides that of relieving pain. It may reduce the swellings from accumulations of fluid, known medically as edema, which come with severe burns. In studies with guinea pigs, scientists have found significant decreases in the swellings with increasing doses of morphine given before the burn. The studies are still going on and it is not known yet whether the preliminary results will prove out, especially when applied to burned humans instead of burned guinea pigs.

Severely burned patients suffer shock, anemia and, if they survive the first shock period, a kind of poisoning from the absorption of poison products from the burned tissues or from infection or both. Plasma, the fluid part of the blood, as well as red blood cells are lost from the circulation.



BURN DESIGN—Survivor of an atomic bomb blast, this Japanese woman was burned in a pattern corresponding to the dark portions of a kimono she wore. Where the garment was tight across the skin, the heat flash burned through, charring the flesh.

into the burned tissues.

Plasma and blood albumin help fight the shock. But severely burned patients need whole blood as well. As one doctor puts it, burned patients "seem to burn up transfused blood."

An A-bomb victim needs even more blood because the radiation from the bomb damages the blood-forming organs in his body. This makes him worse prey, also, to germs not only in the burn or other wounds but to those in the air.

Because the burn patient loses the fluid part of the blood, this also must be replaced, as must salt and other minerals and vitamins. So plasma, albumin, whole blood and salt solutions are given by vein and as soon as he can drink and swallow, fluids of all kinds are "forced."

Proteins for Patients

Steaks and their equivalent in good protein are a "must" in the diet of the burn patient. A protein ration of at least 125 grams per day is advised. That is four ounces or more, and the four ounces means protein, not just meat. It would take at least a pound of sirloin steak, weighed without the bone, to furnish the four ounces of protein.

Because of the vast amounts of blood that would be needed to save victims of an atomic attack, scientists are vigorously pushing research on blood substitutes. More correctly, these should be called plasma substitutes, because so far no one knows of any real substitute for whole blood. Of the plasma substitutes, useful for fighting shock and therefore important, dextran seems at present to hold most promise. This is a Swedish product developed during World War II, a by-product of sugar manufacture.

Being pushed also, under the American Red Cross national blood program, is research into ways of keeping whole blood or red blood cells longer. At present, three weeks is the limit of the useful life of red blood cells and therefore of whole blood that has been drawn from the body. Any material extension of this time limit would make possible stockpiling of blood on a larger scale for use in case of large scale catastrophes.

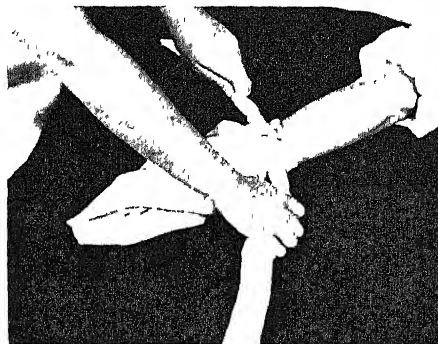
Burns are expected to make up anywhere from one-fifth to one-half the casualties in such an attack.

Estimates based on the Japanese experience may be too high. With any warning of the attack, large numbers of people should be able to find shelter from the heat flash accompanying the bomb burst. If fire-fighting plans now being made are carried out, it should be possible to reduce the number of burn casualties still further, because many of these were caused by uncontrolled fires after the atom bombings in Japan.

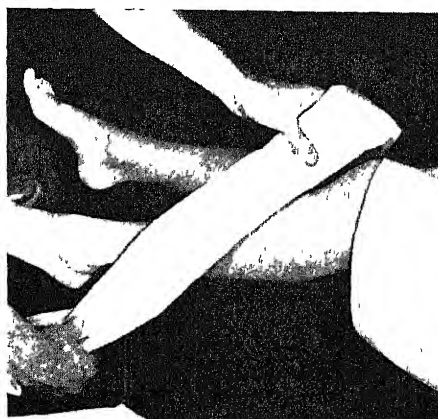
Several thousand severe burn casualties, however, can be expected in any community that is atom bombed. It is to care for these as well as for the victims with serious



HEAD BANDAGE—A shirt, old sheet or handkerchief makes an open face bandage to keep the air from a facial burn or scald.



HAND BANDAGE—Place a dressing over the wounded area; then secure as shown above.



LEG BANDAGE—Start diagonally, take the longer lower end firmly around the ankle once, then spiral up the leg and tie the ends.

bleeding, broken bones and torn and mangled flesh, that 20,000,000 lay persons must be trained in first aid.

Some of you, through your local civil defense organizations, may be called to take special training for work on a burn team. But everyone can learn the simple, immediate first aid treatment for burns, whether caused by atom bombs or an upset pot of boiling liquid on the kitchen stove.

Science News Letter, October 14, 1950

MEDICINE

The How of First Aid to Burns

The first thing to remember about a burn, no matter how severe or slight, or what the cause, is to keep it from getting infected. In other words, keep germs out, just as you are careful to keep germs out of an open cut or other wound.

You might think that a burn would be sterile, all the germs killed by the heat that seared the flesh. Hospital experience, however, shows that this is not the case.

If you can get the patient to a doctor, hospital or burn station quickly, you do not need to put anything on the burn. Watch to see that clothing does not brush against it, that no one coughs, sneezes or, in the case of children, weeps into or onto the burn.

In case of an atom bomb attack, and often in other cases of burn injuries, it may not be possible to get the victim to medical aid very quickly. In such a case, put a sterile dressing on the burn to cover it and protect it both from the air and from germs.

The sterile dressing will help ease the pain. Any covering over a burn helps to stop the pain—but do not use just any covering. At Hiroshima people put rice flour, raw ground potato and cucumber juice on burns. This, says Dr. Everett Idris Evans, burn authority at Richmond, Va., “undoubtedly accounted for the widespread subsequent infection,” even though these substances apparently did relieve pain.

If you have no sterile dressings at hand, use the very cleanest cloth you have. Ironing the cloth or heating it in an oven will make it more nearly sterile and germ-free. Be careful when you put the dressing on and bandage it in place to avoid touching the burn or coughing or sneezing near it.

Nurses and doctors in hospitals wear face masks, you know, when dressing a burn to keep germs from their breath getting into the burn.

If the first sterile dressing does not relieve the pain, put another one on top of the first, without disturbing the first one. The second one very likely will stop the pain.

You can reassure a burn victim who complains of the pain by telling him that the painful burns are not the serious ones. This is because in serious burns, the nerve endings are destroyed and the patient does not feel any pain. Do not, however, tell this to the burn victim if he does not complain of pain.

Many people have a tube or jar of medicated burn ointment in the home medicine chest or first aid kit. Tannic acid was once widely used by doctors to treat burns and ointments containing it were widely sold. Later, doctors found that tannic acid was not good medicine for burns and now they do not advise it. Some burn ointments have medicines in them to relieve the pain. Most authorities now, however, advise that if you do use an ointment, you use a bland petrolatum ointment or jelly, such as Vaseline petroleum jelly.

Shock, the third thing the first aider must be prepared to handle in burn cases, is a subject for a lesson in itself, particularly since shock is something to consider in any major injury.

Science News Letter, October 14, 1950

MEDICINE

Mumps Vaccine Available

➤ A VACCINE against mumps will soon be available commercially. Two pharmaceutical manufacturing companies, Eli Lilly and Company of Indianapolis and Lederle Laboratories, Pearl River, N. Y., have been licensed by the National Institutes of Health in Washington to produce mumps vaccines. The Lederle product is now on the market.

Credit for making the first mumps vaccine in history has been given to Dr. Karl Habel of the U. S. National Institutes of Health. He first attacked the mumps problem in 1940, when Army, Navy and Public Health authorities were expecting large scale mumps outbreaks in military training camps such as occurred during World War I. Dr. Habel succeeded in getting the mumps virus to grow on chick embryos. Following this he prepared a vaccine on a laboratory scale. Unpublished results of success in trials with this vaccine in 1946 have led to development of the vaccines by the manufacturing houses.

At Lederle Laboratories, Dr. Victor Cabasso worked out development of the Lederle product under the direction of Dr. Herald R. Cox.

The vaccine is expected to be used chiefly in schools, camps and other institutions when outbreaks of mumps threaten. It probably will not be advised at present for

routine vaccination of children, because no one knows how long it makes a person immune. Mumps is seldom a serious disease in childhood and an attack gives lifelong immunity. Because it is more serious in adults, particularly men, parents might be advised to have the vaccine if their children are exposed to it during an outbreak in the community.

The Army has no plans for using the vaccine at present. Although World War I experience with mumps outbreaks led to development of the vaccine, mumps was not the expected problem during or since World War II. Reason for this, authorities agree, is that during the period between the two wars increased travel brought rural and city people into such frequent contact that most young people had been exposed to and acquired immunity to mumps by the time they reached military training age.

A simple skin test showing whether a person is susceptible to mumps and a more complicated blood test for immunity to the disease have been developed by Dr. John F. Enders of Harvard. Dr. Enders also made a mumps vaccine, but since this was made from monkey salivary glands, it was not practical for large scale development.

Science News Letter, October 14, 1950

BIOLOGY

Virus Breeding May Be Weapon Against Disease

➤ RESULTS of virus breeding, which might become a new weapon in the fight against diseases such as influenza and poliomyelitis, were reported by Dr. Frank M. Burnet, director of the Walter and Eliza Hall Institute, Melbourne, Australia, at the New York Academy of Sciences in New York.

“Of high practical importance,” said Dr. Burnet was the discovery that the peculiar characteristics of one strain or type of influenza virus might under certain controlled conditions be acquired by another type of flu virus.

In his laboratory he was able to transfer the characteristic of turning to nerve tissue, which is a characteristic of the polio virus, to another type which so far has developed no tendency to turn toward nerve tissue.

Although at present virus breeding is a research matter, a possible future application might be development of vaccines for preventing diseases such as influenza.

Science News Letter, October 14, 1950

PHYSICS

Radiation Indicator Made 50 Times More Effective

➤ THE radiation indicator developed at the University of California at Los Angeles has been made “at least 50 times more effective” than the first model, it was reported.

To get this great increase, the alcohol preservative in the chloroform used in the indicator was removed, Dr. George V. Taplin of the University's staff announced. Dr. Taplin, who works on the University's Atomic Energy Project, first revealed the new radiation indicator last February.

The indicator is small, efficient and cheap, and can be made up in the shape of a cigarette lighter or a fountain pen. It contains chloroform and a purple dye. When struck by X-rays or gamma rays, the purple dye turns yellow.

“By removing the alcohol preservative in the chloroform, the production of hydrochloric acid is increased,” said Dr. Taplin, “thus making it at least 50 times more effective than previous models.”

The new device is called a “dosimeter” because it measures the “doses” of radiation that a person might receive when working near radioactive material or when he entered an atom-blasted area.

Dr. Taplin believes it will be valuable in three ways:

- (1) As a general personnel monitoring badge.
- (2) As an emergency personnel monitoring device for those engaged in rescue work.
- (3) As a strategically-placed area monitoring device.

Science News Letter, October 14, 1950

Incurable Patient Recovers

► THE "swift and dramatic" recovery of a 72-year-old woman who had been kept in a locked ward of Topeka State Hospital in Topeka, Kans., for 17 years as incurably insane was reported by Dr. James M. Mott, Jr., staff psychiatrist at the hospital.

The recovery was not the result of any specific treatment, such as electroshock or medicines. Instead it seems to have resulted from a change in the regimen at the hospital and a new staff of doctors who looked on all the patients as potentially curable.

The patient had been sent to the hospital at the age of 55 after she had tried to kill her husband. A year before that she had shown delusions and other signs of serious mental illness. All the years she was in the hospital she continued to have delusions that people were plotting against her and trying to prevent her being paroled to leave the hospital. She worked willingly and expertly in the sewing room and was very likeable, but made a nuisance of herself to patients and attendants because of shouted harangues about the gangs she thought were plotting against her.

The fact that Dr. Mott looked on her as a patient who might recover, even though she had been considered incurable for 17 years, and treated her in that way in every interview apparently was what brought about her recovery. Previously a doctor had told her, she related, that "she might as well make up her mind she was going to be in the hospital the rest of her life, and to settle down and make as happy an adjustment as she could." She was so isolated from the world that she did not even know about red and green stop lights on city streets.

Dr. Mott soon after his first contact with her took seriously her desire to leave the hospital. He began discussing some reality factors involved in her discharge, such as where she would live, arrangements for weekly visits to the hospital, and the like. He also pointed out, and she readily agreed, that most people thought much of what she said and did was "crazy" because they did not understand her. He persuaded her gradually not to talk about the "plotting criminals" except to him.

She gradually stopped having hallucinations, began going down town, at first with a companion, and after about six months of Dr. Mott's treatment began applying for jobs. Within eight months she was able to take a job as housekeeper for an elderly woman with heart trouble. After that woman died, the doctor who had cared for her and her relatives gave Dr. Mott's patient excellent recommendations which helped her to find another job where she is now working satisfactorily.

Although she has only been out of the hospital six months, and therefore

cannot be considered "cured," her recovery suggests, Dr. Mott thinks, that a similar attitude of expecting recovery should be taken toward the thousands of other patients in mental hospitals who are now labelled incurably insane.

Science News Letter, October 14, 1950

ENTOMOLOGY

Cannibal Mosquito Preys On "Carrier" Cousin

► HAWAIIAN scientists are experimenting with a "cannibal mosquito" from Africa which feeds on its blood-sucking and disease-carrying cousins, trying to work out a program to control mosquito-borne diseases.

The beneficial insects, known technically as *Megarhinus brevipalpus*, are being cultivated and tested in a special breeding colony. They were imported by the Territorial Board of Health from the South African Institute for Medical Research.

The cannibal mosquito does not attack man or animals, entomologists say. But when it breeds in the same waters as more dangerous mosquitos, the larvae eat the young, blood-sucking variety.

One variety of cannibal mosquito was im-

ported into Hawaii in 1929 from the island of New Britain. These all died, however, before any practical tests could be undertaken. The African variety is believed to be sturdier.

Dr. C. E. Pemberton, entomologist of the Hawaiian Sugar Planters' Association experiment station, said the new variety has certain characteristics, different from the New Britain species, which may enable it to thrive under Hawaiian conditions.

If the experiment is successful, scientists in Honolulu are hopeful that the mosquito ally will help control such mosquito-borne diseases as yellow fever and dengue fever.

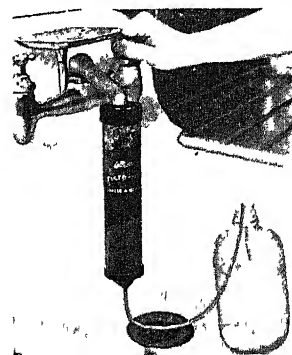
Science News Letter, October 14, 1950

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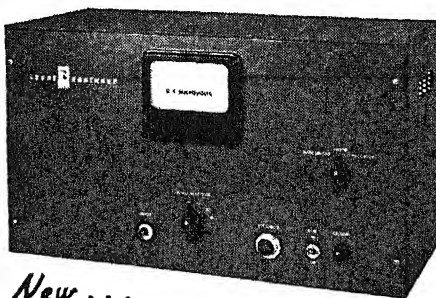


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ZOOLOGY

NATURE RAMBLINGS



Woodchuck

➤ THIS is the time of year when you finally expect to learn how much wood a woodchuck really chucks, assuming the pesky animal could chuck wood after spending all summer digging tunnels through your garden.

The answer is, "Not any." As a timber handler, the woodchuck is a decided flop. He bothers himself not at all in laying in a winter's supply of fire wood, for he has a much better way to keep warm. By dint of all the vegetables he has pilfered, he is a veritable butter-ball by the time frost begins to sting his ears. His layers of fat will insulate him from the cold and supply enough energy to stay alive until another spring brings a new crop of good things to eat.

It is amazing the fine, resounding reputation the woodchuck has built up for himself. Not only is he considered a lumber-jack of the Paul Bunyan school, but under an alias, the groundhog, he is presumed to be an infallible weather prognosticator. Each year on Feb. 2 his opinion on the amount of winter remaining is eagerly sought. Yet there is no authentic case on record of his ever having paid attention to his shadow, even when it was in plain sight. "Groundhog" forecasts might just as well be made by flipping a coin.

The woodchuck, or groundhog, or marmot—call him what you please—is one of the medium-sized rodents, kin to the rabbit and the rat. He has, however, neither the long ears of the rabbit nor the long tail of the rat. He resembles instead his other cousin the guinea-pig.

It is surprising how many rodents are given false positions in the pig pen by colloquial nomenclature—groundhog, guinea-pig, and porcupine for examples. The woodchuck seems to have been given a double pig-christening for "chuck" is an English country dialect word meaning a small pig or shoat.

Although there is no connection in zoology's family tree, the woodchuck does vie with his ham-and-bacon namesakes as an eater and sleeper. He breakfasts heavily, lunches moderately and dines inordinately

on the most appetizing green stuff that he can find. After sleeping from dusk to dawn, he takes a long nap in the morning and a shorter one in the afternoon.

Then, as winter approaches, he retires with a yawn and settles down to a real sleep. Like most of his rodent relatives, the woodchuck is a burrower, though not at all a particular one. Once he has dug a home he sleeps in it, rather than expending any effort in improving it. Why worry about wallpaper in a bedroom, when all one is planning to do is sleep in it?

Science News Letter, October 14, 1950

NUCLEAR PHYSICS

Michigan Atomic Energy Project Self-Financed

➤ THE UNIVERSITY of Michigan's atomic energy project just inaugurated is unique because it has not sought government money, although it has enthusiastic best wishes from the Atomic Energy Commission.

Called the Phoenix Project, this name for the privately financed research into the atom's physics, chemistry, medicine and human problems as well, came rather spontaneously from the Michigan student body when they heard of the plans.

The phoenix of Egyptian mythology was a sacred bird which burned itself upon the altar and rose again from its ashes young and beautiful. In the searing of our civilization through the threat of atomic energy used for destruction, the Michigan Phoenix project may raise something peaceful and useful from the threatened damage.

To the thousands of scientists working for the government directly or indirectly on secret and non-secret research, the Phoenix project will add a small body of experts who attack atomic problems from without the necessary framework of the government organization.

Chairman Gordon Dean of the AEC emphasized in a speech at Ann Arbor the attention that will be paid to social, economic and ethical problems by the Phoenix project.

Science News Letter, October 14, 1950

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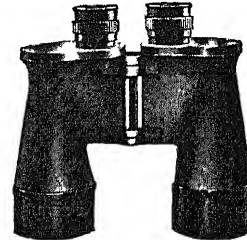
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ACCIDENT FACTS, 1950 EDITION—*National Safety Council*, 96 p, illus., paper, 60 cents Includes information on occupational, transportation, home, farm and school accidents

COMMUNITY LEADERSHIP—*American Association of School Administrators*, 24 p., illus., paper, 25 cents. Written to aid administrators in translating some of the basic concepts of cooperative leadership into community action for school improvement.

CORE CURRICULUM IN PUBLIC HIGH SCHOOLS An Inquiry Into Practices, 1949—Grace S Wright—Gov't. Printing Office, Federal Security Agency Bull 1950 No. 5, 32 p., illus., paper, 15 cents. This bulletin is the outgrowth of a more extensive survey of curricular offerings of public high schools.

EXECUTIVE PLANNING—If AN A-BOMB FALLS—R. Mavil Ballinger—*National Industrial Conference Board*, 19 p, illus., paper, \$1.00. A report giving information about atomic bomb effects and about protective measures industrial plants might use to reduce their hazards

THE FILM BOOK: For Business, Education, and Industry—William H. Wilson and Kenneth B. Hass—*Prentice-Hall*, 259 p, illus., \$4.65 Presents information on many aspects of the film industry.

GLOSSARY OF BOTANICAL TERMS COMMONLY USED IN RANGE RESEARCH—W. A. Dayton—Gov't Printing Office, U. S. Dept. of Ag. Misc. Publ. No 110, 40 p., illus., paper, 20 cents.

GROUP LIFE: The Nature and Treatment of Its Specific Conflicts—Marshall C. Greco—*Philosophical Library*, 357 p, \$4.75 An attempt to explain neurotic and allied difficulties as well as their treatment from the point of view of an historical, group-life approach.

MATHEMATICAL SNAPSHOTS—H. Steinhaus—*Oxford University Press*, 266 p, illus., \$4.50. Many mathematical operations are made graphic and explained

A NATURAL HISTORY OF TREES OF EASTERN AND CENTRAL NORTH AMERICA—Donald Culross Peattie—*Houghton Mifflin*, 606 p., illus., \$5.00. A handbook of trees giving their popular and technical names and general data in non-technical terminology. Many detailed sketches are presented.

THE PHASIAN BIRD—Henry Williamson—*Little, Brown*, 276 p., illus., \$4.00 The story of a hybrid pheasant's fight for survival during the years 1937-1944.

PRINCIPLES OF PSYCHOLOGY: A Systematic Text in the Science of Behavior—Fred S. Keller and William N. Schoenfeld—*Appleton-Century-Crofts*, 431 p., illus., \$4.00. An introductory college text.

SCIENCE AND THE PURPOSE OF LIFE—Boris Sokoloff—*Creative Age Press*, 284 p., \$3.00. The author discusses the problem of integrating religious theories with scientific theories.

SYMPOSIUM ON APPLICATION OF STATISTICS—*American Society For Testing Materials*, 36 p., illus., paper, \$1.00 These papers and discussions were presented at the First Pacific

Area National Meeting of the American Society for Testing Materials, San Francisco, Calif., Oct 10-14, 1949.

TABLE OF THE BESSEL FUNCTIONS $Y_0(z)$ AND $Y_1(z)$ FOR COMPLEX ARGUMENTS—Computation Laboratory National Bureau of Standards—*Columbia University Press*, 427 p., \$7.50 One of a series of such tables which has been prepared by the Computation Laboratory

ULTRASONIC COAGULATION OF PHOSPHATE TAILING—Dudley Thompson—*Virginia Polytechnic Institute*, 77 p, illus., paper, 75 cents The results of an investigation made by the author.

WAVE MECHANICS, Vol. I. Elementary Theory—J. Frenkel—*Dover*, 2nd ed, 312 p, illus., \$3.50 (Vol. 1 & 2 \$7.50) A general survey of the subject of wave mechanics using elementary mathematics.

WAVE MECHANICS, Vol. II Advanced General Theory—J. Frenkel—*Dover*, 524 p, illus., \$5.00 (Vol. 1 & 2 \$7.50). Presents mathematical ideas which form the physical principles of wave mechanics

Science News Letter, October 14, 1950

GENERAL SCIENCE

Russian Scientists Get Credit for This Discovery

➤ HERE is a discovery for which Russian scientists deserve credit. They found eight years ago that two gases that mix readily under normal conditions separate into layers under extremely high pressure. Their observations have recently been confirmed at Yale University.

Two Yale chemical engineers, Prof. Barnett F. Dodge and A. E. Lindroos, are responsible. They found that two gases, which mix intimately under normal conditions, separate into two phases or layers when the mixture is put under a pressure of 50,000 pounds per square inch.

Going further than the Russians, they found another peculiarity which they call a "barotropic phenomenon." The lighter gas, which at first separated and floated on

top of the heavier gas, became heavier and sank to the bottom when pressures were increased

Science News Letter, October 14, 1950

AERONAUTICS

New Device Feathers Propellers Automatically

➤ FEWER crashes of airplanes at take-off are promised with a new electric device for feathering the propellers automatically in case of an engine failure. The device was described in Baltimore, Md., to the American Institute of Electrical Engineers by Wilfred L. Kershaw of the Glenn L. Martin Company.

Feathering a propeller means turning its blades in their sockets so that they cut the air without causing the propeller to revolve. It is common practice with multi-engine craft in case an engine fails. The object is to keep the propeller from "windmilling" or rotating in the wrong direction to create extra air resistance.

The special feature of this device is that it works automatically in two seconds after engine failure. Manual operation by the pilot may be too late to prevent a crash.

The time-lag between the lack of propeller thrust from the faulty engine and the consequent windmilling of the propeller is a matter of seconds, Mr. Kershaw stated, and before the pilot can manually feather the useless propeller, the airplane may be out of control.

The device is complicated from the layman's standpoint. A time delay is to prevent initiating the feathering for cases in which the power loss is of a momentary nature. A special relay causes the delay.

Science News Letter, October 14, 1950



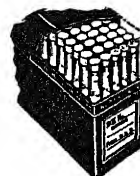
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Science News Letter, October 14, 1950

☼ **SUITCASE CARRIER**, a two-in-one collapsible affair with harness to hold a luggage bag, weighs about one pound and can be quickly attached when needed. Adjustable to bags up to 10 inches in width, the harness and angle-shaped end holders grasp the bag at opposite corners.

Science News Letter, October 14, 1950

☼ **UKULELE PLAYER**, a plastic device which fits over the neck of any standard instrument, eliminates complicated fingering and makes learning to play easy. The player device is a bridge over the neck in which are six buttons, each of which when pressed plays a complete chord.

Science News Letter, October 14, 1950

☼ **RAIN BAG** for a baby, shown in the picture, is zipper-closed but has a hood with drawstring closure. Made of waterproof plastic in blue or baby pink colors, the bag is ample in size to hold an infant wrapped



in a blanket. The durable plastic used can be cleaned with a damp cloth.

Science News Letter, October 14, 1950

☼ **ACCESSORY PACKAGE** for night fishermen contains a gasoline lantern bracket to fit all oar locks, a reflector, a lantern

lighter and two live-bait fishing lures. The bracket permits the lantern to be swiveled 360 degrees as needed. The reflector is aluminum with a high-reflective finish.

Science News Letter, October 14, 1950

☼ **SERVING FORK** for the dining table has a tiny pusher plate between the tines to remove food from them. The plate in this newly patented invention is on the end of a rod that extends through the center of the fork's handle and is manipulated by a finger.

Science News Letter, October 14, 1950

☼ **MOP-AND-WRINGER** combination is designed to ease the job of floor cleaning. On the handle of a mop much like the ordinary household kind is a casing containing rollers for wringing. The wet mop is moved through the rollers by pulling its handle. It is a device recently patented.

Science News Letter, October 14, 1950

☼ **COIN-HOLDING BRACELET**, a recently patented invention, consists of a series of holders, each designed to hold one coin. Coins are engaged beneath a lip and held in place by a spring. The bracelet is ornamental, inexpensive to make, durable and practical.

Science News Letter, October 14, 1950

Do You Know?

Liquefied petroleum gases are now used in cigarette lighters.

In the past 20 years coffee consumption in the United States has almost doubled.

In a single year, there are never more than five eclipses of the sun, both partial and total.

Corn cob pellets, made by grinding the cobs, are successfully used as filler in making a light-weight concrete.

Oysters are good to eat any time of the year but they are fatter and more palatable during the so-called "R" months.

Only 14 states in the nation permit vehicles wider than eight feet on streets and highways except under special short-time permits.

American oil companies have some 156,000 miles of pipelines to move crude oil and finished products; movement by pipeline is the cheapest form of land transportation.



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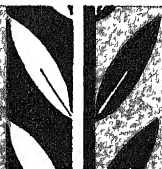
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SOCIOLOGY

Writers Target of Critics

"Culture-personality" writers are accused of oversimplification and circularity of thinking. Emphasis on the part of infant care in character formation is also overdone.

➤ SHARP criticism is leveled at "culture-personality writers" by Drs. Alfred R. Lindesmith and Anselm L. Strauss, sociologists of Indiana University, in a communication to the *AMERICAN SOCIOLOGICAL REVIEW* (Oct.).

"Culture-personality writers" are those who describe a personality as typical of a certain people and explain this character as a product of cultural influences especially in early childhood.

Included in the target aimed at is Geoffrey Gorer, anthropologist author of a recently published book on the *PEOPLE OF GREAT RUSSIA*, in which he explains Russian character as traceable in part to the Russian custom of swaddling infants. (See *SNL*, Sept. 2, p. 147)

Other writers in the group are Dr. Ruth Benedict, author of the much-discussed *RACES OF MANKIND*, Dr. Margaret Mead, author of a discussion of Americans in *KEEP YOUR POWDER DRY*, and other well-known anthropologists.

Over-simplification is one charge made against these writers by Drs. Lindesmith and Strauss. The procedure of these writers raises the question that they may have selected evidence that fits in with their theories and neglected inconsistent data, the sociologists say.

Circularity of thinking is another accusation. The writers, it is charged, deduce a kind of personality from behavior in specific situations, and then explain the behavior in terms of the deduced personality.

In discussions of non-Western peoples, the writers are influenced by Western biases, it is indicated. Anthropologists themselves have warned of the danger that "Western biases must inevitably find expression in the inferences made about the psychological characteristics of given peoples."

"This warning has not been taken into account in anything like its full implications by culture-personality writers," the report charges.

Singled out for special criticism is the emphasis on the character-forming efficacy of infant care—bowel and bladder training, nursing, weaning, mothering, restraint of motion, punishment, etc.

There is no body of evidence to support some of the assertions made, the report indicates.

"Most psychologists and social scientists agree," the report admits, "that there is a special significance attached to first or early learning. . . . What we do not know, and are unable to discover from the culture-personality writings, is what precisely

it is that is learned in early infancy and what its exact significance may be for later training"

In making their explanations of the de-

PHYSICS

"Long-Distance" Seeding

➤ METEOROLOGISTS of the United States Weather Bureau are expected to disagree with Nobel Prize Winner Dr. Irving Langmuir who said that cloud seeding in the Southwest last winter may have caused heavy rains in the Southeast. Dr. Langmuir was the closing speaker at the meeting of the National Academy of Sciences in Schenectady, N. Y.

Pointing out that much seeding with silver iodide has been going on in the Southwest, Dr. Langmuir declared that during the winter in the Southwest there is insufficient moisture and convection activity for the silver iodide to be carried into clouds where ice crystals could form. The prevailing winds, he went on, therefore carry it over the Mississippi Valley where it meets moist air from the Gulf.

When showers occurred last winter in the Southeast as a result of this silver iodide, Dr. Langmuir said, the heat liberated by the condensation of the water in the atmosphere drew in moist Gulf air and north-west winds.

Thus, he said, drought in the Southwest and heavy rains in the Southeast may have resulted from changes in the synoptic weather conditions induced by seeding in the Southwest. During the summer, however, there is enough Gulf air in the Southwest to make seeding effective in giving rain to that region, he stated.

Weather Bureau scientists, who have not agreed with many of Dr. Langmuir's claims, have been pointing to drought in parts of New Mexico where seeding was started in March as an indication that artificial rain-making is not all that its originators claim it to be.

Although Dr. Langmuir's talk gives an explanation of what might have happened to silver iodide particles released into the air in the Southwest last winter, government weathermen are still less prepared to accept the theory that seeding can cause rain hundreds of miles from the point of seeding.

They claim that nature almost always provides enough particles to make it rain

development and fixation of personality in early infancy, these writers make little direct study of infants to determine whether the reactions attributed to them actually occur. It is assumed that the reaction of infants to a given type of treatment "must be" of a certain character.

Some writers, the report states, stress not only that culture shapes personality, but also that personality affects culture, and even advance the idea that institutions could be altered indirectly through changes in child-rearing practices.

Science News Letter, October 21, 1950

when other conditions are right. Dr. Langmuir and other rainmaking advocates claim that there is sometimes a lack of natural particles and that therefore artificial particles introduced by man will make it rain.

There has as yet been no general agreement on a method to be used in counting natural particles in the air.

Science News Letter, October 21, 1950

MINING

Importance of Salvaging Scrap Metals Emphasized

➤ OVER one-third the lead obtained in the United States during 1949 was from scrap and approximately one-fifth the tin was salvaged from a similar source.

The United States must rely heavily upon scrap to meet defense needs for non-ferrous metals, according to Charles W. Merrill of the U. S. Bureau of Mines. Reviewing recent developments in copper, brass, aluminum, lead and zinc, he stated that in view of rising prices and scarcity of major nonferrous metals, scrap must be salvaged.

Due to heavy demands for metals since the end of World War II, most developed and equipped mines in this country are producing to capacity.

If price advances or federal aid make it feasible to exploit low-grade deposits, development will take considerable time. The demands of reconstruction abroad and foreign trade policies of many countries make imports of metals uncertain. Such developments accentuate the importance of scrap, he declared.

"As industrial and military power are so largely dependent on an abundance of metals, the importance to national security of our vast metal accumulation is obvious," he stated. "The scrap metal industry through reclamation helps us to make full use of this pool of metal without undue wastage."

Science News Letter, October 21, 1950

MEDICINE

White Cells as Medicine

White blood cells have now been separated for the first time and will be used to fight disease and atomic radiation ills. They, as red cells, will have to be typed.

► WHITE blood cells, fighters of infection in the human body, will become available for treating disease or atomic radiation ills as a result of the National Blood Program to which Americans by the thousands are giving their periodic pints.

For the first time scientists are separating the white blood cells as they have the red cells, plasma and other important ingredients that save life upon the battlefield and rescue the sick and prevent disease in everyday life.

When Dr. Edwin J. Cohn, the Harvard chemist, demonstrated a new mobile blood processing laboratory-on-a-truck to the National Academy of Sciences in Schenectady, N. Y., quantities of the white cells separated were rushed by air to experimenters who will have their chance to try them in actual experimental treatment.

The early work on the white cells shows that they have types as intricate as the red cell varieties which have been recognized for half a century. Before white cells are used they will have to be typed to see whether they match with the patient's own white cells. Typing the red cells alone will not be enough because the same type of red cell may be accompanied by several white cell types, complicating the already complex picture of exchange of blood between persons and use of blood fractions as drugs.

The new blood processing unit is a complete factory-on-wheels for handling human blood so that every one of the three-score and more blood fractions are saved and most of them actually separated and ready for use. Five centrifuges, constant refrigeration, new plastic apparatus and clever science and engineering applications have entered into this compact and mobile laboratory as a part of our atomic defense.

A score more of them will probably be built ready to take the road for blood handling in any emergency, such as would result from atom bomb attack.

In four hours after the blood is taken out of the donor's veins in an accompanying bloodmobile, the whole separation can be accomplished, resulting in red cells, white cells, platelets and nine essential plasma fractions being produced for medical use or stockpiling. Every bit of the human blood except a little salt water left over of no worth can be utilized.

Blood as processed in past years has provided life-saving plasma and measles-preventing globulin and other applied benefits. Dr. Cohn's new processing, using advanced methods developed by broad cooperative re-

search by scores of scientists, promises even more benefits medically in the future.

The white cells can now be kept alive at least for several weeks, suggesting the

MEDICINE

► DISCOVERY of the first cases in America of humans getting rabbit fever from a domestic water supply is announced in PUBLIC HEALTH REPORTS, official publication of the U. S. Public Health Service in Washington.

Rabbit fever, known also as tularemia, ordinarily is contracted by handling rodents or rabbits which have the germs in their bodies.

The discovery, which it seemed at first might constitute a major public health problem, was made by Drs. W. L. Jellison, of the Public Health Service's Rocky Moun-

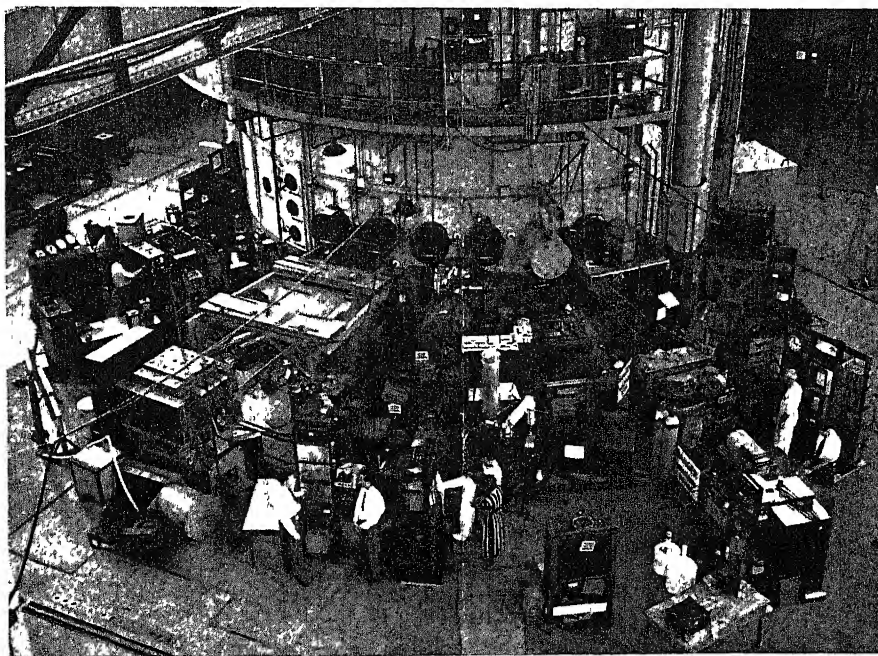
possibility of use for human patients as soon as investigations show what is advisable. The platelets are a promising new raw material for medical use, but this is a development for the future.

In past processing of blood the white cells have been destroyed by the surfaces of glass and metal used to handle the blood. In the new continuous processing this has been prevented by using plastic containers or by coating the glass used with silicone, one of the newer plastics.

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tain Laboratory at Hamilton, Mont., Deane C. Epler, physician at Bozeman, Mont., and Edith Kuhns and Glen M. Kohls of the hygienic laboratory of the Montana State Board of Health at Helena.

Four human patients, present and previous occupants of the same Montana ranch, had definitely contracted tularemia from drinking water during the past year, the scientists report. None of the four had come in close contact with either rodents or rabbits, the most likely carriers of the disease. Dr. Jellison and associates also eliminated contaminated food, but tests of



MOST POWERFUL REACTOR—The most powerful of all nuclear reactors is the heavy-water pile of the Atomic Energy Project at Chalk River, Ontario, under the direction of the National Research Council. The instrument in the center of the picture (where the lady is working) is a neutron spectrometer where the structure of certain chemical compounds is determined. This atomic furnace offers unique facilities for the collection of fundamental data on atomic energy and on behavior of materials under intense bombardment of radiations.

the water supply showed the wide presence of the tularemia bacilli.

Retrospective analysis indicated that two other persons had probably incurred the infection. They had suffered from a protracted and undiagnosed illness.

Public Health Service scientists had been expecting something like this for some time. All cases of tularemia are referred to them by local doctors as requested. They had observed the contamination of natural waters with the tularemia bacillus and these waters are used as rural water supply systems. Just why the tularemia infection from drinking water had not turned up before, as it had in Russia, they were not certain. They suspected, however, that tularemia strains in Montana water, at least, were weak. In another investigation they found that during a 14-month period a majority of the streams in Montana were contaminated.

Commenting on this finding in Montana, Dr. Carl Larson, director of the Rocky Mountain Laboratory of the National In-

stitutes of Health, said that "while stronger strains of tularemia might appear in local water supplies through contamination by heavily infected animals, if that is the mode of contamination, it is still not probable that water-borne tularemia will become a widespread public health problem. Both town and city water supply systems kill the tularemia bacillus through the usual process of chlorination. And in rural areas, if need be, home chlorination or boiling of water would constitute an effective means of control.

"The number of cases is not very great at the present time. Some 1,500 to 3,000 cases, I should say, occur yearly. On the other hand it is not to be dismissed lightly. Its victims suffer badly and for a long period. Tularemia tends to spread rapidly from the point of infection to attack the lymph nodes, spleen, liver, kidney or lung and frequently develops into a typhoid-like state or a typical pneumonia or both."

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in the mouse, but since the chemical has been synthesized there doubtless will be plenty of it for human patients if clinical tests show it is effective.

Scientists reporting the new vitamin are John A. Brockman, Jr., Barbara Roth, H. P. Broquist, Martin E. Hultquist, James M. Smith, Jr., Marvin J. Fahrenbach, Donna B. Cosulich, Robert P. Parker, E. L. R. Stokstad and T. H. Jukes.

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SCIENCE NEWS LETTER

VOL. 58 OCTOBER 21, 1950 No. 17

44,200 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W., Washington, D. C., North 2255 Edited by WATSON DAVIS.

Subscription rates 1 yr., \$5.50; 2 yrs., \$10.00, 3 yrs., \$14.50, single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925, 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STATE 4439

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MEDICINE

Vitamin B Leukemia Aid

➤ ISOLATION and synthesis of a new B vitamin that may help patients with leukemia, though it is not itself a cure or treatment for leukemia, is announced by scientists of the Lederle Laboratories in Pearl River, N. Y., and the Calco Chemical Division, Bound Brook, N. J., of the American Cyanamid Company.

The new vitamin is not given any name in the scientists' report to the JOURNAL OF THE AMERICAN CHEMICAL SOCIETY (Sept.). They merely call it "a substance active for *Leuconostoc citrovorum* and the chick." *Leuconostoc citrovorum* is a bacterium important in the dairy industry. The vitamin is otherwise identified by the Roman numeral I.

The importance of the new vitamin for leukemia patients is that it "competitively reverses the toxicity" of one of the anti-folic acid vitamin chemicals now used in treating leukemia. This anti-folic acid chemical is called 4-aminopteroylglutamic acid.

Patients getting large amounts of the 4-amino chemical sometimes suffer toxic reactions such as painful inflammations and ulcers of the mouth, diarrhea and hemorrhage from stomach and intestines. The new vitamin may overcome these severe toxic reactions and enable doctors to give more of the chemical that helps the leukemia patients. The report in the chemical society journal states only that it reverses toxicity

Question Box

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Photographs: Cover, Arlee S. Tracy, Argonne National Laboratory; p. 259, National Research Council, Canada; p. 261, Air Materiel Command, p. 263, The Johns Hopkins University, p. 266, 267, American Red Cross; p. 272, Tennessee Eastman Corporation

MEDICINE

Salt Water against Shock

Salt water for emergency treatment of shock is advised in event of atomic disaster. Drinking fluids would be limited to salt water for several days.

► DRINKING quarts of salt water daily as emergency treatment for shock in case of atomic or other disaster is advised by the Surgery Study Section, advisory body to the National Institutes of Health and the Surgeon General of the U. S. Public Health Service.

Dr. Frederick A. Collier, professor of surgery at the University of Michigan, is chairman of the group which is made up of professors of surgery and a few other medical authorities from various parts of the country.

The salt drink treatment should be "adopted for widespread use in any large-scale disaster involving the civilian population," the group recommends.

The salt water would be made of about one level teaspoonful of table salt and one-half teaspoonful of baking soda in each quart of water. Except in extremely hot weather, no other drinking fluid would be permitted during the first few days following the injury that caused the shock.

The solution is said to be quite palatable and burn patients, who are very thirsty, will consume a sufficient amount without urging. In some cases, when there is collapse of blood circulation in the small blood

vessels, the solution must be given by injection into the veins.

In case of an atomic bombing, 60% of the surviving population might suffer from burns in addition to other injuries causing shock. Other large scale disasters also are followed by large numbers of shock cases.

Whole blood and blood plasma or albumin are and will remain essential for the treatment of such patients. But in large scale disasters if blood supplies run low and if blood or plasma is not immediately available, the salt water treatment is expected to prove life-saving.

The salt water treatment should be included in Red Cross training programs so that all first aid personnel including firemen, policemen, air raid wardens and housewives will know about it and be prepared to use it. Dr. Leonard A. Scheele, Surgeon General of the U. S. Public Health Service, said.

The salt water treatment was worked out in 1943 by Dr. Sanford M. Rosenthal of the National Institutes of Health. Dr. Rosenthal's results, obtained with mice, were considered so promising that Dr. Collier, Dr. C. A. Moyer, dean of the Southwestern

Medical School of the University of Texas, and others tried it for human burn patients. Their results form the basis of the Study Section's recommendations.

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AERONAUTICS

"Squirting Gertie" Frosts Up Before Defrosting

► "SQUIRTING Gertie" is the familiar name of an Air Force airplane, equipped at the Wright-Patterson Air Force Base, Dayton, Ohio, which can coat itself with snow and ice at the will of the pilot while flying at high altitudes.

Attached to the outside of the plane, a C-54, is a maze of pipes with nozzles arranged so that they can shower the plane with a steady stream of water or produce a mist so fine that it becomes a fog. At high altitudes, this artificial fog freezes the instant it strikes the fuselage. A special propeller lying just behind the nozzle also becomes coated with ice.

The purpose of this plane is to study icing and de-icing problems. Two chief means are now used to protect planes for ice. One is mechanical, the other thermal. The mechanical method utilizes an expanding section located on the leading edge of the wing to crack the ice and allow the air stream to peel it off.

The thermal method relies chiefly on heating the airfoil surfaces with hot air to prevent ice from collecting. Tests are now being conducted to determine the feasibility of using combustion heaters which will warm the surfaces of the plane from the inside. One of the main problems in developing this method is to obtain light-weight and space-saving equipment.

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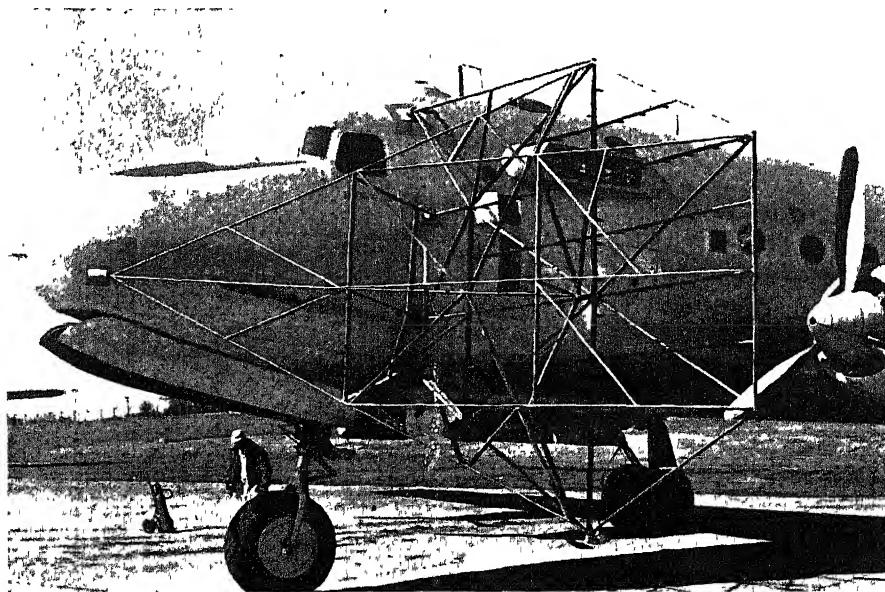
CONSERVATION

Low-Grade Fuels for Civilians Due to War

► POSSIBLE shortages of gasoline and fuel oils in case of extended war were discussed in Atlantic City, N. J., by leading petroleum producers and users at a meeting of the National Petroleum Association. No shortages may develop but civilians may have to use lower-grade products.

The military need for high octane components for aircraft gasoline will lower the octane level of certain motor gasolines, the group was told by C. M. Larson of the Sinclair Refining Company, New York City. Also, any national emergency requirements for certain components of other petroleum fuels will restrict or change such fuels for commercial and civilian usage.

The all-out war need for large quantities of jet fuel will cut deeply into the kerosene, range oil and other fuel production. The jet fuels require components used by diesel bus engines, in farm tractor



"SQUIRTING GERTIE"—"Gertie" is doing her bit by helping engineers fight the dangers of aircraft icing with experiments at Ypsilanti, Mich. The plane carries outside an elaborate maze of aerodynamically fitted pipes containing nozzles which can turn ordinary water into rain, snow, fog or mist. It creates only a minimum of drag, slowing down the plane to which it is attached by less than 10 miles per hour.

distillate fuel, range and space heater fuels and for many other purposes.

Future emergency requirements of military fuels, such as high-grade aviation gasoline and jet fuels, have an effect on the composition of motor gasoline, the meeting was told by Maj Ray W. Whitson, Munitions Board Petroleum Committee, Washington, D.C.

During an emergency it becomes necessary to remove alkylate, catalytically cracked gasoline and other high octane number components from civilian motor fuels to produce more high-grade aviation fuel, he said. Also it is necessary to remove straight run from civilian motor fuel, kerosene and

diesel fuel to produce more jet fuels. Motor fuel, both military and civilian, will consist of those components not required for aviation fuels.

A brighter note in regard to the total supply was struck by Dr. Gustav Egloff, Universal Oil Products Company, Chicago. The oil industry is producing 3,000,000 barrels a day of motor fuels, and another 500,000 barrels a day could be produced from a million barrels of crude oil production which is now shut in. The oil industry can supply any demand made by the Armed Forces for motor fuels, and the chemical industry can also supply antioxidants, metal suppressors and tetraethyl lead.

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GENERAL SCIENCE

Small Schools May Suffer

► MANY smaller colleges for men may well collapse if the proposed system of deferring college students for the draft is adopted.

This is only part of the drastic effect the system would be bound to have on the American colleges, college presidents think. They cannot quite fathom how extensive the effect will be, but there are several possibilities.

The deferment policy, a result of advice to Selective Service Director Lewis B. Hershey by six advisory committees made up of educators and scientists, would establish a nation-wide aptitude test for all draftable high school seniors and all draftable men already in college. Those who received a grade on the test higher than a cut-off point to be established would be given deferment, those who failed would not be deferred. The suggested cut-off mark is one equivalent to 120 on the World War II Army General Classification Test.

Once a man is in college, he must do good work to continue his deferment. Only those in the upper 50% of the freshmen class would be deferred to become sophomores, the top 66 2/3% of the sophomores could become juniors and the top 75% of the juniors could complete college and graduate.

This policy has been generally accepted by General Hershey and is now being studied on the policy making levels of the executive branch of the government.

Under present Selective Service law, most high school seniors will be able to go through the college freshman class without worrying about the draft, since they will be 18 years old and they cannot be drafted until 19. It has not yet been decided whether to wait until a man is 19 before giving the test or to give it upon his graduation from high school regardless of his age.

Approximately 300,000 males now enter college every year. It is estimated that 60% of these could pass the aptitude test, and thus receive a student deferment for their

freshman year. However, this will have a quite different effect on different colleges. For such places as M I T, Harvard, the University of Chicago, it is believed that most, if not all, students who could meet the institution's qualifications would pass the Selective Service aptitude test. But, under the law, half of these could not receive student deferments to become sophomores.

On the other hand, for many smaller colleges, it is estimated that only a little more than 16% of the applicants could pass the aptitude test. The test therefore would cut out most of the male freshmen except the 30% who would be deferred for other reasons. That 16% who remained, however, would be likely to stay in the upper portions of their classes throughout the college life.

For smaller colleges for men, this might well be a serious blow.

But the "selective" institutions, those that select students with high aptitude for college work before admitting them, face a problem of a different kind. Practically all entering freshmen would be, by Selective Service standards, capable of doing good college work. Yet the institution must lose 75% of these to the armed forces before they graduate.

Large state universities will be least affected. Partly because they are dependent on state legislatures for funds and partly because of the American idea that everyone who wants to should have a chance at a college education, state universities take almost everybody who applies. Then they do their weeding out after the freshman year. The net result of this proposed system of weeding out by Selective Service regulation would be quite similar to the normal process.

The nation's educators are particularly worried about the possible "plowing under" of smaller colleges with lower standards. These institutions are usually in sections of the country where education is needed the most.

However, General Hershey's six advisory committees took the attitude that any other

system of deferment might well be even more unfair. The aptitude test was the point of greatest discussion in the committee meetings. In a session of the American Council on Education recently, committee members challenged the college presidents to come up with something better which still would keep the needs of the armed forces in mind.

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AERONAUTICS

Gas Turbine in Heater Warms Arctic Planes

► SIX-ENGINE giant bombers of the B-36 type can be warmed up ready for take-off in sub-zero weather within 15 minutes with a new portable gas turbine heater developed in Los Angeles, Calif. It is a product of AiResearch Manufacturing Company, and warms up all mechanisms as well as the engines.

It is claimed to be the first portable ground heater using a gas turbine engine. The engine is a lightweight compact affair which is started by electric push button and a single battery. One heater has now been delivered to the Air Force for which it was developed.

During extreme cold weather when mechanical equipment freezes tight, this heater will be used to heat up engines and aircraft cabins, de-ice wings, control surfaces, landing gear and to free hydraulic lines.

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BIOLOGY

Anti-Fungus Chemicals From Earth Mold

► TWO anti-fungus chemicals from a mold-like organism of the earth were reported by Elizabeth L. Hazen and Rachel Brown of the New York State Department of Health at the New York Academy of Sciences meeting.

One of the chemicals, named fungicidin, promises on the basis of mouse studies to be useful in treating at least one serious fungus infection which attacks brain and central nervous system as well as the skin and other parts of the body. The causative fungus is called *Cryptococcus neoformans* and the disease it causes is known by several names: cryptococcosis, European blastomycosis, torulosis and Busse-Buschke disease.

Mice infected with this fungus had their lives prolonged by repeated sublethal doses of crude preparations of fungicidin.

Fungicidin in laboratory tests has shown activity against a large number of other fungi, some of them disease-producing, but in much higher concentrations it is not effective against some common bacteria. Its value as a remedy for human patients is now being tested.

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PSYCHIATRY

Prevention by Removal

Spotting and committing obvious maniacs to institutions will prevent violence to public heretofore a necessary occurrence to secure the commitment of a person.

➤ DR Douglas Kelley, the psychiatrist who studied the Nazis at the Nuremberg trials, looks forward to the day when human "mad dogs" may be spotted and committed to institutions before even their first bite.

Dr. Kelley, now professor of criminology at the University of California, Berkeley, expressed this opinion in Colorado Springs, Colo., at the 57th annual conference of the International Association of Chiefs of Police.

The psychiatrist pointed out that at the present time it is practically impossible to get an obvious maniac committed until he commits an act of violence. However, he said that scientific methods are becoming increasingly accurate for picking out potentially dangerous individuals before they do harm.

For example, he pointed out that a psychiatrist working with the police can compile a scientific case history of a known "crank" or other deviant based on repetitious complaints common to these people, until enough data for commitment are obtained.

Where the individual may be dangerous but not hopeless, preventive psychiatry, involving family consultations and referrals to clinics, can be employed to restore the person.

He said that increasing employment of

psychiatry by police can not only protect society but also help in seeing that justice is done.

He cited the use of psychiatry in cases of sex psychopaths as an example. Repetition of offenses may be prevented by the psychiatrist's recommendation of commitment in appropriate cases. On the other hand, the psychiatrist can prevent injustice particularly in sex cases involving children, by correcting mistakes brought on by childish imagination, parental emotion or actual psychopathology.

The psychiatrist said that increasing interest on the part of the public, the judiciary and law enforcement officials eventually will make it possible largely to put away dangerous individuals before they become a menace to the community.

Dr. Kelley said the police psychiatrist may also help in administering the law by teaching police to make simple tests to determine the mental age of complainants, witnesses, and suspects. He said that estimates indicate that as many as 20% of the population is below par intellectually.

"If a witness, complainant or suspect runs below a mental age of eight years, his testimony is perhaps worthless, or at any rate he will require special attention in interrogation," Dr. Kelley said.

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GENERAL SCIENCE

Speed-Up in Research

➤ THE DEFENSE Department is launching an all-out speed-up in military research and development so that the western allies' fewer men will be able to outclass the huge communist armies. But it is beginning to have a hard time finding competent scientific personnel to man this effort.

The effort, directly related to our overall manpower shortage should a total war come, is sparked by a \$120,000,000 supplemental appropriation for military research granted by the last session of Congress. Defense officials figure that new weapons, better weapons and more of them will more than make up our manpower difference with the Russian-dominated nations.

Before the Korean crisis, an average of \$550,000,000 a year was spent on research and development. About 54,000 scientific and technical people were working on military research and development at all levels—35,000 of them for Defense Department contractors.

But the rate at which the nation has produced competent scientific personnel at all levels from Ph.D. down makes the task of spending the extra \$120,000,000 hard. Also, some industrial laboratories that have contracts with the Defense Department are reluctant to increase the proportion of research they do for the department.

Of course, industry and university laboratories are having a hard time securing competent scientific personnel too. The National Research Council's Office of Scientific Personnel pointed out recently that, over the three-year period from 1946 through 1948, only 416 Ph.D.'s in physics came out of the schools, 166 in bacteriology, 278 in mathematics, 27 in medicine and surgery and 25 in meteorology. All those are fields directly related to the defense effort.

Thus, research and development officials in the Defense Department are anxious to see colleges turn out as many young scientists as possible. They welcome the new

National Science Foundation and its fellowships, they would like to see some broader system of federal scholarships.

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ENTOMOLOGY

Going Price for Lady Crickets: 5 Cents Each

➤ DR Vincent G. Dethier, biology professor at Johns Hopkins University, wants 1,000 crickets. Lady crickets. To cricket trappers of the nation he is offering five cents, cash on delivery, for each of the insects brought back alive.

The female cricket, Dr. Dethier explained, is distinguished chiefly by her long slender egg-laying tube. She has the odd ability to taste with the end of this tube.

Dr. Dethier wants to study how heat and cold affect this taste sense, which is tied to the insect's egg-laying habits. To prospective cricket-trappers, he issued these instructions:

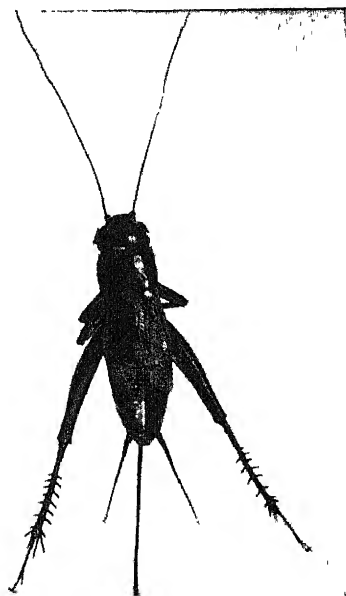
Look for crickets under logs or rocks. Clap them into a milk bottle.

Be sure to feed them, he said. Put in some lettuce or a piece of apple. Otherwise they will eat each other.

"Leave five crickets alone in a bottle on Friday and you may end up with only one very big cricket by Sunday," he warned.

Dr. Dethier will accept only live, genuinely feminine crickets in batches of ten or more. He is confident of getting them. Another Johns Hopkins entomologist each summer puts up a reward for fireflies. Last summer he was swamped with 270,000 of them.

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CALLING ALL CRICKETS—Female, that is. The long thin tube at the tail is the chief distinguishing feature of the female. The photograph is enlarged two and one half times.

PHYSICS

Great Store of Energy in Empty Space of Universe

➤ THE EMPTY space of the universe between the stars and the planets contains 50,000 times as much energy per unit volume as the uranium used in the atomic bomb. Yet there seems to be no way to use it, for it is energy as absolutely frozen as the temperature of outer space.

This problem is a prime unsolved mystery of science that Dr. Paul Scherrer, Zurich physicist, posed at the dedication of the new General Electric Research Laboratory in Schenectady, N. Y.

The immense content of energy of empty space is a consequence of the zero point energy of radiation, involved in the quantum theory so fruitful in explaining the atom. The amount of energy in space is equivalent to some 700 million million kilowatt hours per cubic foot.

"If it really exists," Dr. Scherrer told the scientists, "it should by its mass alone produce enormous gravitational effects." All the matter in the universe would be concentrated in a space about equal to the orbit of our moon. Since this is not the case, the present theories are inadequate and as Dr. Scherrer pointed out this is a challenge to further research.

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NUCLEAR-PHYSICS

AEC Has No Plans to Heat Towns by Atomic Energy

➤ THE Atomic Energy Commission has no plans for using our atomic piles to heat nearby buildings or entire towns as is reported being planned for the Harwell piles at Britain's atomic energy establishment.

Spokesmen for the AEC said that our plans are concentrated on direct conversion power piles, such as the submarine ship reactor, that will change atomic energy directly into commercial or useful power.

The big pile at Hanford, our largest atomic installation, was built to be cooled with water, not air. It would not now be economical to convert this pile to air cooling, AEC officials state.

Since the Brookhaven pile is air cooled, however, it would be possible to convert some of the energy from the pile for heat purposes if desired.

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GEOLOGY

Fourth Large Glacier in Sierra of Pleistocene Era

➤ DISCOVERY of evidence that a large glacier descended both the east and west slopes of the Sierra Nevada mountains approximately 1,000,000 years ago was announced by Dr. William C. Putnam, professor of geology at the University of California at Los Angeles.

Three previous glaciers have been known by geologists to have been active in the Sierra in Pleistocene times. This is the fourth—and largest—that has been found.

This quartet of California glaciers, says Dr. Putnam, is not related to ice advances in the eastern and middlewestern United States.

The U. C. L. A. geologist made his discovery in a tunnel being driven through the mountains in the Owens Gorge, near Bishop, Calif., by the Los Angeles Department of Water and Power engineers.

Nearly 400 feet of volcanic ash covered the glacial deposits, revealing periods of active volcanism between the various ice advances.

This part of the eastern Sierra is one of the most actively-faulted in the world. Hundreds of fault marks are to be found in this region which was a highly volcanic area in the recent geologic past. Deposits left by the final ice advance have been cut by faults, showing that this activity is even more recent than the California ice age.

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AERONAUTICS

Pilot's License after Ten Hours Flight Time

➤ YOU can learn to fly a plane and earn your government-approved license after only ten hours of flight training. That is the promise put forth in Urbana, Ill., by three psychologists who are also pilots.

They have already shown that some students, but not all, can pass their CAA flight test after ten hours of instruction. Secret of the short learning period is use of a Link trainer specially modified to simulate conditions usually encountered by small, light planes in flight.

Link trainers were originally designed to teach instrument flight procedures. They are much cheaper to operate than a plane.

To boost the percentage of persons earning their licenses after ten hours of flight time, the psychologists recommend further research into more extensive use of flight training aids, more training of instructors in Link teaching methods and "intellectualizing" of a maneuver by a student before performing it either in flight or in a Link.

Dr. William G. Matheny, Ralph E. Flexman and Edward L. Brown of the Institute of Aviation at the University of Illinois conducted tests on 47 students, half of whom received the regular course.

Final CAA flight tests for license were given by two sets of examiners. Of the Link group, 43% passed while only 19% of the control group passed the CAA examiners. Seven pilots who were already licensed took the test without the knowledge of the examiners. Only three, or 43%, of them passed.

Science News Letter, October 21, 1950

MEDICINE

One-Fourth More Premature Babies Might Be Saved

➤ ONE-FOURTH of the premature babies that now die each year might be saved, at no added cost, if the babies were cared for in special Premature Centers or in hospitals having separate premature nurseries with a separate qualified nursing staff and supervision by pediatricians.

This is the conclusion of a study of mortality and cost experience with premature infants in Illinois in 1948 reported by Dr. Henrietta Herbolzheimer, medical administrative assistant to the director of the Illinois Department of Public Health, in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Oct. 14).

Even the cost of care in the hospitals with special equipment and staff and the cost of transportation in special ambulances to these hospitals does not exceed the cost of care in other hospitals, she found.

Until premature births can be prevented, Dr. Herbolzheimer suggests that the pattern of care provided in the special hospitals should be aimed for. At least, she points out, the idea that this pattern would save one-fourth the babies now lost should be put to test by accumulation of more data.

Science News Letter, October 21, 1950

MEDICINE-PHYSICS

Chemical May Be Antidote For Uranium Poisoning

➤ A CHEMICAL that shows promise of being an antidote for uranium poisoning, hazard facing atomic energy plant workers unless suitable precautions are taken, has been discovered by scientists in the department of radiation biology at the University of Rochester School of Medicine and Dentistry in Rochester.

The compound is a polyphosphate. When albino rats were put on diets containing a uranium nitrate compound, 10 out of 25 were dead in 21 days and 13 of 25 were dead at the end of 45 days. But when 25 rats on the same uranium-containing diet were given two polyphosphate injections a day for five days, none had died after 21 days and only one at the end of 45 days.

The experiment is a "preliminary" one, the scientists pointed out in a report to the American Physiological Society. But the polyphosphate seemed to have "marked antidotal properties" in the uranium poisoned rats.

Scientists who made the discovery are Drs. Elliot A. Maynard, Harold C. Hodge and William L. Downs.

Science News Letter, October 21, 1950



MEDICINE

Cortisone for Arthritis By Mouth, Not Muscle

➤ ARTHRITIS patients lucky enough to get cortisone to banish their aching, painful stiff joints may in future be able to take this anti-rheumatism remedy by mouth instead of having it injected into their muscles.

Trials of cortisone pills in four patients showed that this form of the medicine gives results as good as are obtained with injections and as good as with ACTH, Drs. R. H. Freyberg, C. T. Traeger, C. H. Adams, T. Kusou, H. Wainerdi and I. Bonomo of the Hospital for Special Surgery and Cornell University Medical College report in the journal, *SCIENCE* (Oct. 13).

Science News Letter, October 21, 1950

ZOOLOGY

Mice Like Peanut Butter Better Than Cheese

➤ *MUS musculus domesticus* likes cheese, but he likes peanut butter and rolled oats better.

Now *Mus musculus domesticus* is not, strange as it may seem, a domesticated muscular mouse—although this is not to say muscular mouse don't like peanut butter too. But the fact is, *Mus M. domesticus* is the ordinary northern house mouse.

And with the revelation that peanut butter rates higher than cheese with mice, the U. S. Fish and Wildlife Service yanked the props right out from under an old American tradition.

The debunking of cheese took place at a national rat (and mouse) control conference in Baltimore, Md., sponsored by the Fish and Wildlife Service and the Baltimore, Md., Health Department.

Put a dab of peanut butter on a mouse trap and then cover the entire trap with a handful of oats, said Fish and Wildlife Service scientist Walter W. Dykstra. The mice will choose this smorgasbord fare without hesitation over cheese.

Mr. Dykstra gave other unusual data on the No. 1 American house pest. Mice, he said, live out their lives within 10 to 20 feet from the place where they are born.

They eat 20 to 30 times a day, yet consume only about one-tenth of their own body weight in food in 24 hours. Thus, to poison mice effectively, a chemical must be extremely potent and must be widely distributed about the house, he said.

A mother mouse will bear from 30 to 57 offspring in a year. Her young will mature within three months. The inevitable result is that a mouse family is apt to be a large affair.

Historically, mice are among the world's most ancient pests. They bothered Asiatic tribes 4,000 years ago, Mr. Dykstra said. Aristotle complained of mice, yet the Greeks erected statues to them because they chewed the straps from the enemy's armor.

And of all the inventions offered each year to the U. S. government, the one which comes in greatest numbers is the better mousetrap.

Science News Letter, October 21, 1950

BIOLOGY

New Micro-Guinea Pigs for Research

➤ SCIENTISTS now have a new kind of guinea pig for research in which living creatures are needed. This new guinea pig is microscopic in size and is actually not a guinea pig but a microorganism something like the algae which grow on stagnant ponds. Name for this group or class of organisms is chrysomonads. Studies with them were reported by L. Provasoli and S. H. Hutner of the Haskins Laboratories, New York City, at the National Academy of Sciences meeting.

Another alga, a flagellate, *Euglena gracilis* by name, needs the new anti-anemia vitamin B₁₂. The water of a pond on which this *Euglena* develops regularly contains B₁₂ throughout the year, William J. Robbins, Annette Hervey and Mary E. Stebbins of the New York Botanical Garden found. They believe from their studies that the synthetic activity of microorganisms, especially bacteria and actinomycetes, and not that of higher plants, is the original source of vitamin B₁₂ in nature.

Science News Letter, October 21, 1950

MEDICINE

100 Times More Potent Pain-Killer Synthesized

➤ A PAIN-KILLER 100 times more powerful than the procaine your dentist uses as a local anesthetic was announced at the meeting in Schenectady, N. Y., of the National Academy of Sciences.

This and other new local anesthetic drugs were synthesized by R. O. Clinton and F. P. Luduena of the Sterling-Winthrop Research Institute at Rensselaer, N. Y.

They were made by substituting certain chemical groups in the nucleus of the procaine molecule and tested by the sciatic nerve block method in guinea pigs.

With the exception of one, the ortho-methoxy compound, the new chemicals appeared to be less toxic than procaine on an activity basis.

They show a "very favorable" ratio between activity and irritation. For example, the ortho-propoxy compound is about 10 times as active as procaine and only twice as irritating.

Science News Letter, October 21, 1950

GENERAL SCIENCE

Unesco Grants Aid Science Information Centers

➤ THE CREAM of the world's scientific developments will soon be more easily available to scientists in the Far East and in South America.

Two grants, out of a total of \$1,000,000 announced by UNESCO, the United Nations Educational, Scientific and Cultural Organization, will be used to set up information centers for scientists. One of these will be in India to serve the Far East, and the other is planned for Mexico to serve South America.

Much of the rest of the money authorized will be used to combat illiteracy and to raise the standard of living of people in 12 countries in Asia, North and South America and Africa.

Science News Letter, October 21, 1950

MEDICINE

Malignant Cancer Requires Bunch of Cancer Cells

➤ A CANCER that grows and threatens life appears at a location where "a critical number of cancer cells are bunched together," but a single cancer cell surrounded by normal tissue cannot start malignant growth.

This theory of the origin of cancer was presented by J. C. Fisher and J. H. Hollomon of General Electric Research Laboratory at the meeting in Schenectady, N. Y., of the National Academy of Sciences.

The idea behind this theory is that individual cancer cells in normal tissue are bathed in normal chemistry. A cancer cell surrounded by others of its kind, on the other hand, is bathed in abnormal chemistry where malignant growth is no longer inhibited.

This critical size idea, the scientists stated, "gives new life to the mutation theory of cancer." According to the mutation theory, normal cells change into cancer cells and these continue to reproduce themselves as cancer cells. But this theory, the scientists pointed out, has had difficulty in explaining why there are many more cancers in middle aged and older persons than in young persons.

Mutation rates should remain substantially constant with time, the scientists declared. When the critical size idea is introduced, however, a constant rate of mutation leads to a relationship in which the number of cancers in a population varies with the age of the population raised to the power of the number of cells in a critical size colony.

Experiments with cancer-causing chemicals and observations concerning the location of cancers that have spread from other cancers support the critical size concept, the scientists stated.

Science News Letter, October 21, 1950

MEDICINE

Shock and Broken Bones

Shock which comes with severe injuries may be fatal unless treated. In case of broken bones, "splint them where they lie."

By JANE STAFFORD

Fourth in a series of atomic bomb first aid.

➤ SEVERE bleeding, bad burns, broken bones, crushing injuries, shell, bomb and bullet wounds all call for treatment of shock. Because shock is easier to prevent than to cure, first aiders are taught to begin treatment immediately without waiting for symptoms of shock to develop.

The kind of shock that comes with severe injuries is a state of collapse in which all body functions are depressed due to failure of the circulation. Severe shock is always serious and may be fatal.

Besides the original injury, the following factors may contribute to shock: pain, rough handling, improper transportation, continued bleeding, exposure to excessive heat or cold, and fatigue. The aged, the very young and the discouraged are apt to suffer more from shock. Remember these factors when you are giving first aid to an injured person, so that you do not add to the shock he has already suffered.

Symptoms of Shock

Most common symptoms of shock are paleness, a cool, clammy skin and a feeling of weakness or faintness. Perspiration on the forehead, around the lips and on the palms of the hands is another symptom. A weak, sometimes rapid pulse, nausea and vomiting are symptoms of shock. The patient in shock is often indifferent to what is going on around him and to questioning. Unconsciousness is also a symptom of shock.

These symptoms may not all show in one patient. Usually they develop gradually and the victim may seem perfectly all right at first, only to collapse later. Even a patient in deep shock may not show signs that the first aider can detect.

For these reasons, first aiders are taught that persons with even minor injuries should lie down, and that in every case of serious injury, shock should be treated. The only possible exception to this rule would be in the event of an atomic attack or other large scale disaster in which the first aider's first job after stopping severe bleeding might be to get the injured person out of the hazard area.

Loss of blood is one cause of shock, so when you stop the bleeding you are also helping to overcome the shock, or at least to keep it from getting worse.

First aid directions for treating and preventing shock cover four points:

1. **Position.** Keep the patient lying down flat. If the injury is severe, raise the lower part of the body a foot or so. If a chest injury makes it hard for the patient to breathe, raise his head and shoulders slightly and keep the legs flat. Never force an injured person to stand or walk except in the unusual situation where you may have to get him away from flames or falling walls. Even then it would be better to have him carried.

2. **Heat.** The idea is to keep the patient comfortable but not hot. The old idea of applying heat to a patient in shock has been revised because it is now known that coldness of hands and feet in such cases is due in part to constriction of the blood vessels. This is the body's way of making up for the deficiency in circulation.

So you try to conserve the body's heat without adding too much to it. Simplest method is to cover the patient with blankets, coats, newspapers or whatever is at hand. Remember to put the covering under as well as over him, to protect him from the coolness and possibly dampness of the ground. In hot weather, a small amount of covering may be enough. You do not want your shocked patient sweating. In very cold weather you may use hot water bottles to

keep his body from losing heat. Be careful not to burn him. He may not feel the heat or be able to tell you it is too hot, but can nevertheless get a burn from too hot a water bottle.

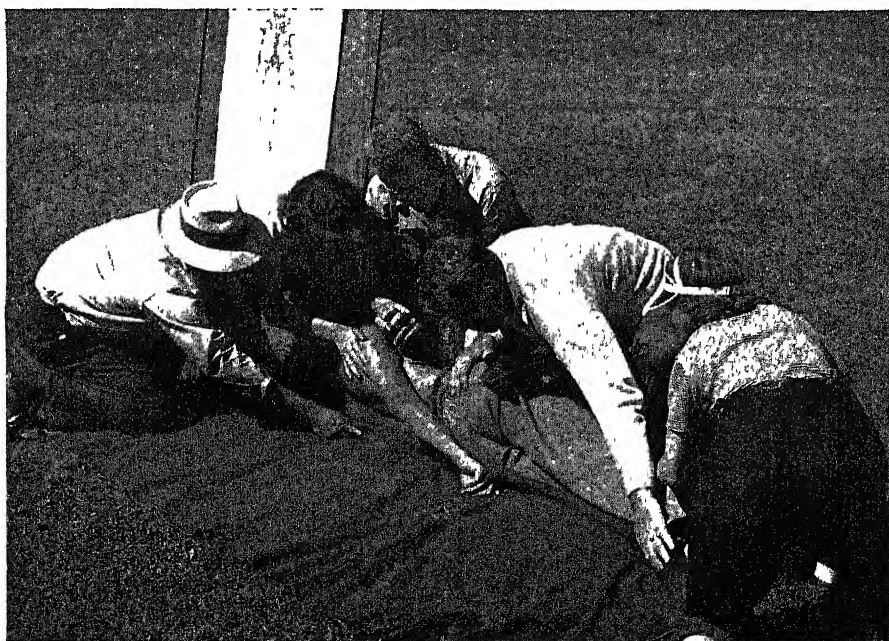
3. **Fluids.** Don't give an unconscious patient anything to swallow and don't try to pour fluids down his throat. But if the patient is conscious and can swallow, and is not nauseated, small amounts of warm water, broth, milk, tea or coffee may be given. The fluids will help keep him warm and will help replace the fluids he may have lost in blood due to the injury. A cupful every half hour is enough. You may need to feed it from a spoon.

4. **Do not give stimulants.** They have no value in the first aid treatment of shock. Avoid unnecessary questioning and handling of the patient but care for other injuries.

Prime Rule in Broken Bones

"Splint 'em where they lie" is a cardinal rule for first aid in case of broken bones. In case of large-scale disasters, such as an atomic bomb explosion, it may be necessary to move the patient out of a hazardous area before splints can be applied. The rule should be remembered, however, and applied whenever possible.

One reason for the rule is that any movement of the broken ends of the bone may further damage nerves and muscles and may break large blood vessels, causing



UP AND UNDER—First aid trainees at a Red Cross school practice placing a blanket under an injured person without lifting him from the ground.



SPLINTING BONES — *Materials readily at hand, such as this newspaper splint or the pillow, jacket or first aid textbook itself, can be used to improvise a splint for a broken arm.*

serious loss of blood. A second reason is to keep a simple fracture from becoming a compound fracture.

Simple and Compound Fractures

Fracture is the medical term for a break in a bone. A simple fracture is one in which the bone is broken but there is no connecting wound from the broken bone through the skin. A compound fracture is one in which the bone is broken and there is a connecting wound from the break to the surface and through the skin. The bone itself may have broken through the skin or the bullet, piece of flying debris or other object that broke the bone may have caused the wound.

A compound fracture is much more serious than a simple one because germs may invade the break in the skin.

Symptoms of a broken bone are swelling, pain or motion about the injured area, tenderness of the area when touched, and deformity. With a compound fracture there

is the wound, which may be large or very small and may or may not have bone protruding through it.

Often the victim feels or hears the bone snap. If he can point to the place that hurts, the first aider may be able by moving his fingers gently over the place to feel the break. But don't manipulate it or try to move it to hear the ends grate. And never ask the victim to try to walk if you suspect a broken bone in the leg. It is dangerous and even if he could walk, he might nevertheless have a fracture that does not go all the way through the bone.

Broken Ends and Joints

If you suspect a bone is broken, keep the broken ends quiet and keep the adjacent joints quiet. Control shock. In case of a compound fracture, control bleeding and bandage a sterile dressing on the wound. If a bone is protruding, try to handle the injury in such a way that the bone will not slip back under the skin carrying germs with it and causing further damage.

Of course you will send for a physician in all cases of broken bones, just as you do in any other case for which you must give first aid. If you have to take the patient with a broken bone to the physician or hospital, you must be very careful that the ends of the broken bones are not moved at any time during the journey.

For this purpose, you may use splints if the break is in a bone of arm, leg, thigh or wrist. If you have to improvise splints, use as rigid materials as possible, and have them amply wide and long enough. Boards used as splints should be as wide as the arm or leg.

Splints should be long enough to extend beyond both adjacent joints, above the break and below the broken bone. Pad splints well, to reduce danger of cutting off circulation because of swelling of the part. For the same reason, examine every splinted part at least every 30 minutes and loosen the ties holding the splints if circulation is cut off, or if the part becomes too painful.

Fractures of neck, back and skull should be given great care because of the danger of damage to the brain and spinal cord

Brain concussion, or injury to the brain, may occur with or without a fracture of the skull. Unconsciousness, complete or partial, and for a short or long time is one symptom of concussion. For concussion, with or without fractured skull, keep the patient lying down, raise his head and shoulders slightly unless he is pale, and keep his body moderately warm. Do not give stimulants. Take care of bleeding and wounds.

In case of broken back or neck, keep the patient lying flat, don't let him sit up or raise his head, don't bend his neck, twist his body or flex his body. Try to keep his back, head, neck and body all in one line, or plane.

Transport on Rigid Frame

If he must be transported, this should be done on a rigid frame, taking great care to support head and neck carefully as he is slid onto the frame. Don't double him up or "jack-knife" him into the back seat of a car. Death or paralysis may be the result of such improper handling.

Symptoms of broken ribs are pain in breathing or coughing and tenderness over the fracture area. First aid for these consists in tight bandages put around the chest while the patient constricts it by exhaling. But if he coughs or spits up blood, a lung may be punctured. In that case, do not put on bandages. Keep him quiet and warm with his shoulders raised somewhat until the doctor arrives.

Another frequent symptom of rib fracture is shallow breathing. Deep breathing makes the pain worse. The patient may also try to keep part of his chest over the broken rib from moving with every breath by keeping his hand held tightly over it.

Science News Letter, October 21, 1950



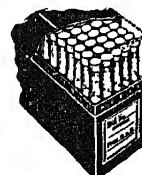
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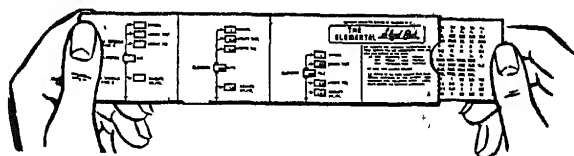
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GEOLOGY

Sulfur from Libya Lakes

➤ UNIQUE possible sources of sulfur for English industries are desert lakes in Libya, North Africa, it was revealed in London by the British Department of Scientific and Industrial Research. The sulfur will come from sulfides which were reduced from sulfates in the lake water by action of bacteria.

Great Britain needs sulfur particularly to make sulfuric acid, an essential in many industrial processes. American industries are using some 35,000 tons a day of this acid, it is estimated. The British Isles import all their sulfur, much of it now coming from the United States.

Recent surveys made by British scientists show that desert lakes in Libya are well supplied with microorganisms known as sulfate-reducing bacteria which reduce sulfates to sulfides. Sulfur can be produced from hydrogen sulfide by simple aeration.

Sulfur is now being recovered from these lakes, K. R. Butlin and J. Postgate of the British Chemical Research Laboratory state. But the recovery is only in relatively small

quantities. In the dry season sulfur is scooped up by Arabs from the bottom of the lakes and left to dry.

The quantity available is not sufficient to meet export needs. The rate of production of sulfide is low. To make the process economically feasible, the reduction of sulfates must be stepped up to about ten times the present rate.

More effective bacteria to produce sulfides from the sulfates are now being sought by the British scientists. Strains of bacteria from different parts of the world will be examined for their speed of reduction. The influence of different environments will be investigated. Methods of obtaining possible quick reducing strains by artificial means will be explored.

Science News Letter, October 21, 1950

RADIO

High Hill Near Rio Site Of City's First TV

➤ SUGAR LOAF mountain close to Rio De Janeiro is the site of a commercial television broadcasting station now nearing completion. The 150-foot antenna on the top of 1,300-foot Sugar Loaf will provide an extended reception area.

This TV transmitter is being erected by the International General Electric Company and will be ready for use in the near future. The equipment was constructed by General Electric's electronic department at Syracuse, N. Y. Programs of the Rio station will include studio shows and remote broadcasts from the city's race track and athletic fields.

Erection of the station on the summit of Sugar Loaf presented many difficulties because the site can not be reached by automobile. A cable car to the top for tourists brought some of the equipment. Much was carried to the top by mules.

Science News Letter, October 21, 1950

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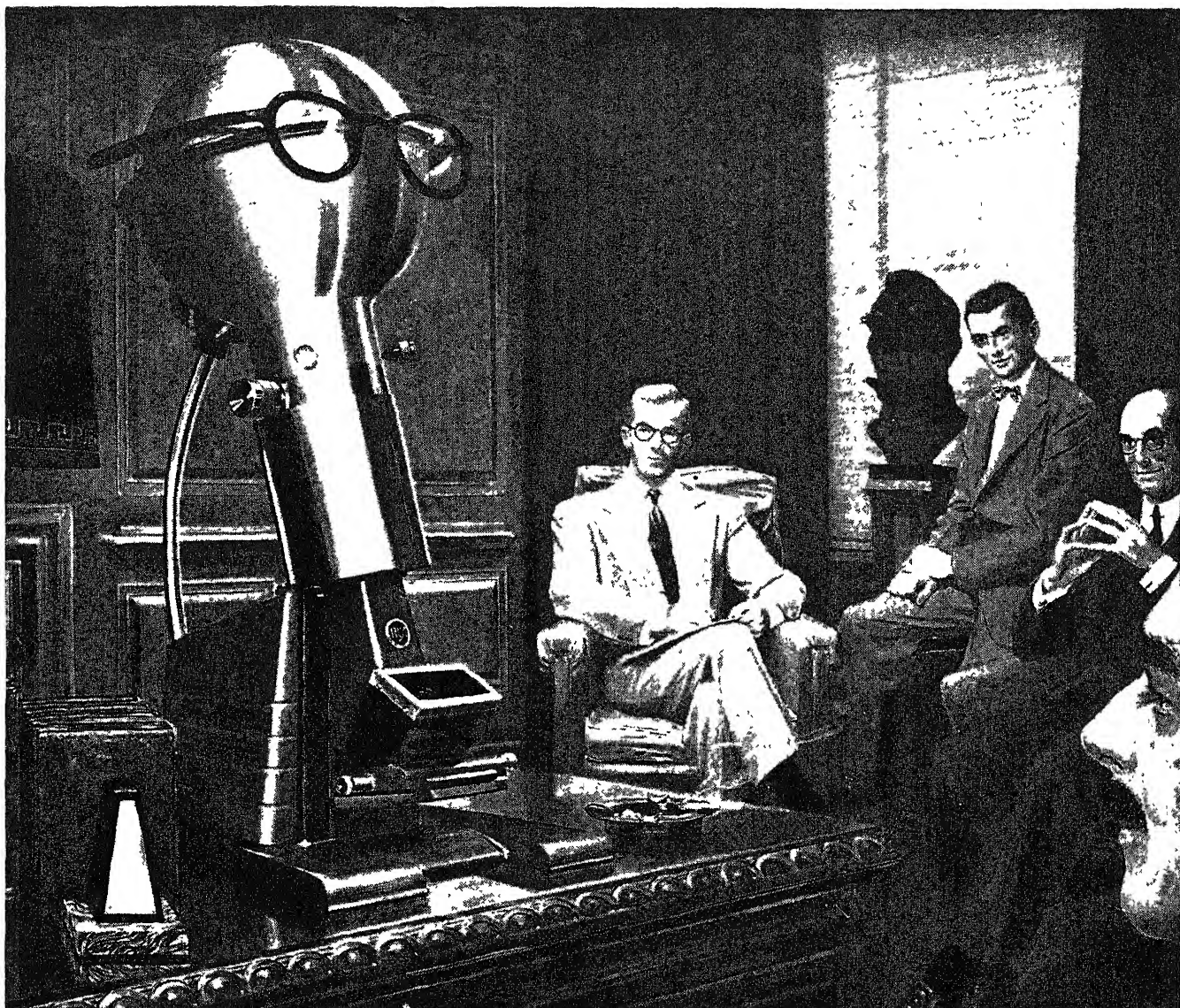
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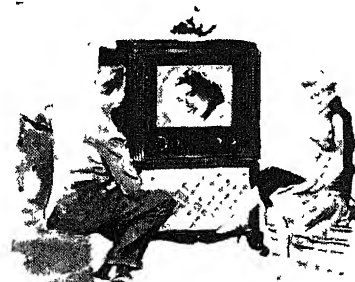
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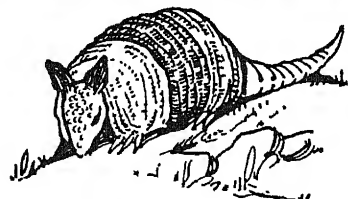


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Armadillo

➤ WHEN the Spaniards first climbed up on the plateaus of Mexico they found creatures in coats of mail, no less wearers of armor than Cortez himself. To these the intrigued conquerors gave a lasting name, "Armadillo," a Spanish word which translated as a whole English phrase: "Little fellow in armor."

The armadillos in the United States, a nine-banded family, are the country's only armored animal and the only representative of the edentates, zoological division which also includes the sloth, the ant-eaters and the aard-vark. The last-named, an African ant-eater, has gained fame by being the first full word in Mr. Webster's dictionary.

Since the time of Cortez the armadillo has worked north from Central America, crossing the Rio Grande into Texas about a hundred years ago. They may now be found from New Mexico eastward to Louisiana and as far north as the Oklahoma Panhandle. In somewhat different form, as baskets, their shells may be found in curio shops everywhere.

In ancient times, South American armadillos grew to monstrous size, as long as 16 feet, and perhaps looked at the world with more aggressiveness than their descendants do today.

But now, from large leathery ears to the tip of a tail which resembles a series of telescoping funnels, Mr. Armadillo measures no more than three feet. He is a confirmed pacifist liking nothing better than to be left alone; yet his strong odor and the groaning, grunting and snuffling with which he roots for food are often his undoing.

As protection against his greatest enemies, man, coyotes and mountain lions, nature has given him a thick, bony cuirass and surprising speed. When attacked or alarmed, he may bounce straight up into the air several times, then race away; or he may roll himself up into a ball and wait for the enemy to tire of the siege and go away. This is a last resort. Instead, he will try to dig a quick burrow with strong front claws. But he often gives himself away by leaving his long bony tail above-ground.

The night-prowling animal crosses shallow streams by walking on the bottom. For deeper crossings he huffs and puffs

up his insides until they are tight as a balloon and nearly as buoyant. Then he swims, holding his long slender snout above water.

The armadillo's offspring invariably arrives as quadruplets, all of the same sex and developed from a single fertilized egg.

Science News Letter, October 21, 1950

PHYSICS

Beads, Sparkling and Lustrous, Are Radioactive

See Front Cover

➤ TINY glass beads, some sparkling, others dark and lustrous, and all of them valuable, have been made by scientists at the Argonne National Laboratory in Chicago. They are shown on this week's cover of SCIENCE NEWS LETTER in comparison with the point of a common pin.

But you wouldn't want a necklace of them, because these are radioactive beads. They were made for experimental use, to give a small but intensely radioactive source that can be imbedded in living tissues to study the effects of radiation.

Details of their preparation are reported by Drs. Walter Kisielski, George Svihla and Austin M. Brues in the journal, SCIENCE, (Oct. 6).

Science News Letter, October 21, 1950

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Books of the Week

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ARTIFICIAL INSEMINATION IN LIVESTOCK BREEDING—A. H. Frank—*Gov't. Printing Office*, U. S. Dept. of Ag. Circ. No. 567, 71 p., illus., paper, 25 cents. States the advantages, difficulties, and limitations of breeding cattle artificially.

THE ATOMIC-MOLECULAR THEORY—Leonard K. Nash—*Harvard University Press*, Case 4, 115 p., illus., paper, \$1.35. A study of some of the pivotal stages in the development of the modern atomic and molecular theory.

CHAIM WEIZMANN: Builder of a Nation—Rachel Baker—*Messner*, 180 p., \$2.75. A biography of the first president of Israel.

HANDBOOK OF HUMAN ENGINEERING DATA FOR DESIGN ENGINEERS—Handbook Staff, Tufts College—*Navy Special Devices Center* (Distributed by Office of Technical Services, U. S. Dept. of Commerce), tech. report no. SDC 199-1-1, 427 p., illus., paper, \$5.00. Three years in preparation, this handbook is a systematic treatise on the science of designing mechanical equipment on the basis of studies of human capabilities.

HUMAN MILK: Waitime Studies of Certain Vitamins and Other Constituents—S. K. Kon and E. H. Mawson—*His Majesty's Stationery Office*, (U. S. Distributor: British Information Services), 188 p., illus., paper, \$1.00. The results of a four-year study.

THE HUMAN SPECIES: A Biology of Man—Anthony Barnett—*Norton*, 280 p., illus., \$3.75. The author's purpose is to relate the main facts of human biology to the social problems of our time.

MEDICAL MYCOLOGY—Friedrich Reiss, Conference Chairman—*New York Academy of Sciences*, 192 p., illus., paper, \$2.75. A series of papers concerning fungus research in the light of medical progress. These papers grew out of a conference on Medical Mycology held by the Section of Biology of The New York Academy of Sciences, Oct. 31-Nov. 1, 1947.

MORPHOLOGY AND TAXONOMY OF FUNGI—Ernst Atheran Bessey—*Blackiston*, 791 p., illus., \$7.00. A textbook of mycology, the science which studies fungi. An extensive bibliography covering general works in the field of systematic mycology are included.

MUSEUM BUILDINGS, Vol. I—Laurence Vail Coleman—*American Association of Museums*, 298 p., illus., \$10.00. \$8.00 to American Association of Museums members. A planning study of many museums which are located throughout the United States.

THE NININGER COLLECTION OF METEORITES: A Catalog and A History—H. H. Nininger and Addie D. Nininger—*American Meteorite Museum*, 144 p., illus., \$3.00. A record of 27 years in meteorites.

PARADOXES OF THE INFINITE—Bernard Bolzano—*Yale University Press*, 189 p., illus., \$3.75. Published under the editorship of Dr. Fr. Prihonsky and translated by Donald A. Steele, this book shows some of the insight that Bolzano enjoyed in the most abstract depths of mathematics, science and metaphysics.

PRINTING TYPES AND HOW TO USE THEM—Stanley C. Hlasta—*Carnegie Press*, (Distributing Agent: Rutgers University Press), 304 p., illus., \$7.50. Information on many type faces most commonly used in books, magazines and advertising.

PROCEEDINGS OF THE OHIO HIGHWAY ENGINEERING CONFERENCE 1950—*College of Engineering, The Ohio State University*, 157 p., illus., paper, \$1.00. Held in connection with the Ohio Department of Highways, April 3-6, 1950.

PROPERTIES OF FLAMMABLE LIQUIDS, GASES AND SOLIDS—*Factory Mutual Engineering Division*, 12 p., paper, free upon request to publisher, 184 High St., Boston 10, Mass. A reference booklet. One feature of this work is the listing of more than 650 flammable materials found in industrial plants.

PSYCHOANALYSIS AND RELIGION—Erich Fromm—*Yale University Press*, 119 p., \$2.50. The author discusses the modern issue between traditional religion and the philosophy of psychoanalysis.

STRUCTURAL CARBOHYDRATE CHEMISTRY—E. G. V. Percival—*Pientice-Hall*, 246 p., illus., \$7.35. An advanced college text.

STUDIES IN MENTAL ILLNESS IN THE GOLD COAST—Geoffrey Tooth—*His Majesty's Stationery Office*, (U. S. Distributor: British Information Services), 71 p., illus., paper, 65 cents. A study of juvenile delinquency and the forms of mental illnesses found in the Gold Coast.

TERRAMYCIN—Chester S. Keefer, Conference Chairman—*New York Academy of Sciences*, 240 p., illus., paper, \$3.00. Discussions of the new antibiotic. This series of papers is the result of a Conference on Terramycin held by the Section of Biology of the New York Academy of Sciences on June 16-17, 1950.

A TEXTBOOK OF HISTOLOGY: Functional Significance of Cells and Intercellular Substances—E. V. Cowdry—*Lea & Febiger*, 4th ed., 640 p., illus., \$8.50.

UNRAVELING JUVENILE DELINQUENCY—Sheldon and Eleanor Glueck—*Commonwealth Fund*, 399 p., illus., \$5.00. A research study comparing 500 persistently delinquent boys with five hundred non-delinquent boys in respect to ethnic derivation, age, intelligence quotient and residence in underprivileged areas.

UTILIZATION OF CORNING GRADE CRUDE OIL RESIDUE—Joseph M. Quattlebaum—*College of Engineering, The Ohio State University*, 37 p., illus., paper, 75 cents.

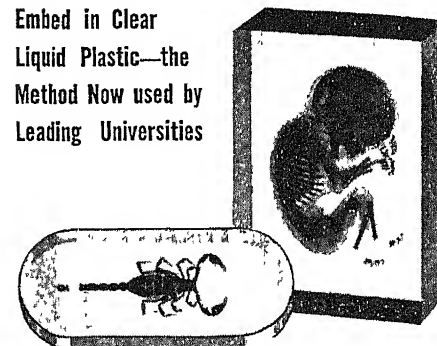
WEEDS: Guardians of the Soil—Joseph A. Cocannouer—*Devin-Adair*, 179 p., illus., \$2.75. Discusses the advantages of the controlled use of weeds.

WORLD DISTRIBUTION OF POLIOMYELITIS 1900-1950—*American Geographical Society*, \$1.25. Map folded to size 5 x 7½ inches; \$1.50 flat map 25 x 38 inches. The first of a series of maps showing worldwide distribution of different diseases.

Science News Letter, October 21, 1950

NEW WAY to preserve Science Specimens

Embed in Clear Liquid Plastic—the Method Now used by Leading Universities



Scorpion embedded in Castolite. Human embryo embedded in Castolite. Photos, courtesy School of Medicine, Univ. of Ill.

• The preservation of biological, anatomical, pathological, botanical and other specimens has long been limited to immersion in preservative liquids or to mounting dried samples.

Now, thanks to recent research in the chemical field, a new liquid plastic has been developed which provides the perfect, permanent medium for embedding insects, plants, embryos, mineralogical and other specimens. This new plastic, known as Castolite, has already been tested and approved for specimen preservation by hundreds of the country's most progressive educational institutions, ranging from elementary schools to leading universities, such as Harvard, Yale, M.I.T., Chicago U., Universities of Ill., Wis., Calif. and many others of equal standing.

Army, Navy, Dept. of Agriculture—
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• New Machines and Gadgets •

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⚙️ **EAR MUFFS** for youngsters have soft fur on the insides and on the two outer sides plastic figures of popular faces framed in fur. The metal connecting frame is adjustable to fit various heads; weather conditions will not harm the washable plastic figures.

Science News Letter, October 21, 1950

⚙️ **TINY HEARING AID** is nearly unnoticeable in the user's ear, being only slightly larger than the button on a man's shirt. It has very wide frequency range, and also high and low tone control to provide sound selectivity at either end of the range.

Science News Letter, October 21, 1950

⚙️ **WINTER OVERSHOES** are made of nylon except for crepe rubber soles. The outer fabric is a special nylon weave, the lining is a soft, deep pile nylon fabric. These boots are light in weight, well shaped, and offer a shield against both cold and wetness.

Science News Letter, October 21, 1950

⚙️ **LUBRICATOR** for small machines and instruments, shown in the picture, has a transparent plastic barrel to hold the oil and a slender oiling tube which operates in holes up to three-fourths of an inch



deep. Finger pressure on a button on the top dispenses the oil.

Science News Letter, October 21, 1950

⚙️ **PLASTIC RULER** for the office desk can be used also as a postal scale. For weighing, it is held between two fingers, by a short metal shaft, three inches from

one end, on which the ruler swings freely. A sealed envelope stuck in a slot on the short end balances against the weight of the long end.

Science News Letter, October 21, 1950

⚙️ **BOX REFRIGERATOR**, suitable for small apartments or to take on a picnic, is aluminum on inside and outside, with fiber glass between to provide the insulating protection. It is a lightweight affair, with two compartments, one for food and the other for ice.

Science News Letter, October 21, 1950

⚙️ **MICROSCOPE LAMP**, which uses an ordinary 40-watt electric bulb, is a two-pound device with the bulb inside a cylindrical casing with a condensing lens of the bull's-eye type. With ball-and-socket joint to direct the light, the ventilated casing has a shield to protect the user's eyes.

Science News Letter, October 21, 1950

⚙️ **S.A.W.DUST REMOVER**, for attachment to the ordinary handsaw, is a newly patented device which blows the dust from the line on the lumber being followed by the carpenter. It is a tubular device, attached near the handle, that picks up air as the saw is pushed forward, delivering it to the surface below.

Science News Letter, October 21, 1950

Do You Know?

There are more rats than people in the United States.

Cashew nuts eaten by Americans come largely from India.

The sugar crop of Cuba for 1950 will total over 6,000,000 tons, it is expected; it is Cuba's third largest sugar crop.

A 4,000-foot viaduct under construction in Cincinnati will serve as a traffic aid by keeping through east-west automobiles off busy surface streets.

The best place to find fossils is in sedimentary rock formed by deposits of sand and silt; in it plant and animal tissues could be buried without being crushed.

Calcium chloride, employed to keep canned whole tomatoes firm until used, reacts with the pectin compounds in the vegetable to form a gel which tends to preserve the tomatoes in their original shape.

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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Smithsonian Institution
National Museum of Natural History
Washington, D.C.

"Footprints in the Sands of Time"

See Page 278

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VOL. 58 NO. 18 PAGES 273-288

METEOROLOGY

Rainmaking Not Proved

➤ AN OFFICIAL committee of the American Meteorological Society, appointed to look into the claims of the rainmakers, will declare that the possibility of artificially producing any useful amounts of rain has not been demonstrated so far, Science Service has learned.

The findings of the committee will appear in a future issue of the BULLETIN OF THE AMERICAN METEOROLOGICAL SOCIETY, signed by the four members, Dr. Bernard Haurwitz, chairman of the department of meteorology at New York University, Gardner Emmons, research associate at NYU, Dr. George P. Wadsworth, professor of mathematics at Massachusetts Institute of Technology, and Dr. H. C. Willett, professor of meteorology at MIT.

Dr. Haurwitz, chairman of the committee, told Science Service that he personally did not believe that last winter's rainmaking efforts of Dr. Wallace Howell under contract to New York City resulted in any "appreciable amount added to New York's reserves because of seeding." This, however, was not part of the report of the committee.

The committee report begins by complimenting Dr. Irving Langmuir, Vincent Schaefer and their co-workers of General Electric and Project Cirrus for the great advance in recent years in the understanding of the formation of atmospheric ice and water particles.

It states that because these matters are still imperfectly understood and because weather forecasting is still not perfect, it is extremely difficult to evaluate claims of success in rainmaking.

Then the committee tackles the problem from two angles. First approach is to estimate the probable rain if no attempts to make rain by cloud seeding had taken place. Looking into experiments by Dr. Langmuir and others in New Mexico last year, the committee declares that weather conditions at the time were quite favorable

and adequately explain the moderate amount of rain that occurred.

Dr. Langmuir has claimed that the Weather Bureau did not forecast the rain that he said was produced by his cloud seeding.

Concerning later papers by Dr. Langmuir which stated that seeding in New Mexico last winter may have produced dry conditions there but abnormal amounts of rainfall in the Mississippi valley, the committee declares that it is even more difficult to judge the effects of seeding. However, the members claim, the rainfall and weather patterns were quite similar to a number of corresponding periods in the past. What happened last winter, they imply, happened before without benefit of seeding.

Second approach to the problem, the committee says, is statistical. Dr. Langmuir has never said that his seeding produces rain. But he has said that the chances were only one in ten to the 26th power—that is the figure 10 with 26 zeros after it—that the rain which fell in New Mexico after seeding was produced by chance alone.

The committee claims that the necessary precautions in this kind of figuring have not been observed. It declares that necessary to such a calculation of odds is a complete analysis of the entire situation, starting with a statistical analysis of the original data on moisture distribution, winds and rainfall in relation to topography.

Since these and other factors have not been observed, the committee says, the odds cited cannot be accorded scientific credence.

This is not the end of the argument on rainmaking. However, concurrent with the argument, attempts are being made to bring the two sides together so they can at least agree on a body of facts from which to draw their conclusions. Conferences between proponents of the two sides may be expected to produce results sometime in the future.

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still marks an upper class grave, but there are fewer now than formerly. Class distinctions show up in the location of the grave, upper class desirability depending upon such factors as who is buried nearby and whether the lot is on "high ground."

At the "end of the line" so far as social class is concerned is the potter's field. Lower class families will go to almost any length to avoid burial there. Bodies interred at potter's field are stripped of all the traditional symbols. They are buried without flowers, without clothes, without graves and without names. Burials are in long rows of trenches with a number on a wooden paddle marking each body. If the body is not claimed in a certain length of time, it is dug up and burned in an adjoining crematory to make room for new bodies.

Aside from this treatment of bodies in potter's field, cremation is an upper class custom. Cremations have increased from 7% to 17% in the last 10 years in Philadelphia, almost entirely in the upper classes. This trend presents a serious problem not only to funeral directors but to cemeteries. Cremation urns cost only a fraction of what caskets do. Also the normal four- or six-grave lot holds eight or 12 bodies in caskets, but it will hold an almost unlimited number in urns.

More or less public "viewing of the body," is a poorer class custom; upper class families restrict the viewing to members and do not exchange comments on the appearance of the body. One out of ten of those on the social register have no viewing.

There appear to be no class differences in the kind of flowers used at funerals or in cemeteries; that depends on the season. But there is a difference in flower arrangement. The rich like baskets and sprays. The poor prefer wreaths, pillows of flowers, "bleeding hearts" and set pieces such as "gates ajar."

The wearing of mourning and mourning bands and use of crepes on the door are going out of style completely in all classes. But a small minority of poor people still shutter the windows and stop the clock to show the hour of death.

If you see a 20- to 30-car funeral procession, it is probably that of a poor person. When an upper class funeral leaves the funeral parlor, the majority of those attending do not proceed to the cemetery. Among the poor practically everyone goes.

Ministering to the dead is big business in the United States, Dr. Kephart reports. There are about 25,000 funeral directors and some 520 casket manufacturers currently in business, and the number of cemeteries has been estimated at about 40,000.

Funeral directors want to be considered a professional group and require a course at a mortuary college in addition to high school graduation for members of the group. There are 24 mortuary colleges in the United States, two affiliated with major universities.

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SOCIOLOGY

The Cost of Death

➤ AMERICANS pay more for funerals than they do as patients in hospitals.

Death costs more than \$700,000,000 yearly! This is the estimate of Dr. William M. Kephart, of the University of Pennsylvania, who reports a survey he made in Philadelphia to the AMERICAN SOCIOLOGICAL REVIEW (Oct.).

Largest item of expense is the casket, ranging in price from about \$75 to \$15,000. The former is cloth-covered, the latter of solid bronze. In Philadelphia, there is practically no sale for the bronze type although

it is reported that four or five are sold each year in New York City to customers other than gangsters. Lavish gangster funerals, Dr. Kephart reports, are largely mythical and evidently a Hollywood invention.

Class distinctions that set off the rich Philadelphian from his poorer neighbors are still in force after death. But they are not the same as they were in past years.

Historically, the rich man was buried in a large cemetery lot and his grave was marked by a large memorial or mausoleum. Today, if you see a mausoleum it probably

MICROBIOLOGY

Germ Warfare Detection

Centers for detection of germ warfare are being planned as a part of civil defense. A number of agents could be used in attack, but large-scale epidemics are unlikely.

➤ **ESTABLISHMENT** of germ warfare detection centers is a part of Federal civil defense plans, Dr. Victor H. Haas, director of the Microbiological Institute, National Institutes of Health, revealed at the meeting in Chicago of the College of American Pathologists.

Federal agencies are also now planning as part of their civil defense activities to train selected scientists in germ warfare detection and defense methods. These in turn will train other scientific and technical personnel.

The training is needed because laboratory workers engaged in usual peacetime operations are not familiar enough with procedures used in germ warfare detection.

Laboratory directors must be prepared to detect and frustrate attempts to produce germ warfare agents in the United States, Dr. Haas warned.

"An enemy can attack us with infectious agents or biological toxins," Dr. Haas declared emphatically in one of the few statements that have been made by a government official on this hush-hush subject since the release early in 1946 of the Merck report on the nation's biological warfare program during the last war.

Large-scale epidemics, however, are unlikely to result from germ warfare attacks, in Dr. Haas' opinion.

Many disease-causing germs and their poisonous products are stable, resistant to heat, drying and sunlight, capable of quantity production and suitable for dissemination in the air, water, milk and so on, Dr. Haas stated.

"Any bacteriologist can think of a number of agents which could be used to attack us," he said, giving as examples: 1. viruses, such as influenza or psittacosis (parrot fever); 2. rickettsiae, such as those causing Q fever or typhus; 3. bacteria, such as the typhoid or cholera organisms or the agents causing plague or tularemia; 4. fungi, such as histoplasma or coccidioides; and 5. toxins such as that produced by the botulism germ.

"There is abundant reason," he declared, "for believing such agents could be used against us as part of an attack with explosive munitions or by sabotage before or during actual warfare."

"A simple but important measure in helping to prevent attacks with these agents will be to frustrate attempts to produce them here in the United States."

"An enemy with access to a laboratory might manufacture sufficient quantities of

live organisms or their toxins to permit extensive sabotage.

"Alertness and vigilance on the part of laboratory directors, careful supervision of all activities under their control and scrutiny of any excessive or unusual demands upon bacteriological supplies or equipment should minimize the possibilities for surreptitious production."

Because agents of biological warfare, or B. W. as scientists term it, are not detectable by the physical senses, Civil Defense Health Services will have to set up a system of air sampling and accumulate records of normal

germ populations of the air in target areas and strategic buildings and installations under a variety of conditions, Dr. Haas stated.

Present methods and apparatus are inadequate for detecting most of the agents that might be used to attack us, Dr. Haas said. Even such germs as were caught by the samplers would be identified too slowly. But he thinks a start could be made and expects improvements in the methods.

The first sign of an attack with B. W. agents, he said, will probably come some days after the attack has taken place and will depend on the appearance of illnesses resulting from exposure to the germs or toxins.

We can expect, he said, "a number of primary casualties resulting from a mass initial exposure, and that secondary cases will be absent or minimized."

"It is not expected that large-scale, self-perpetuating epidemics would develop as a result of attack."

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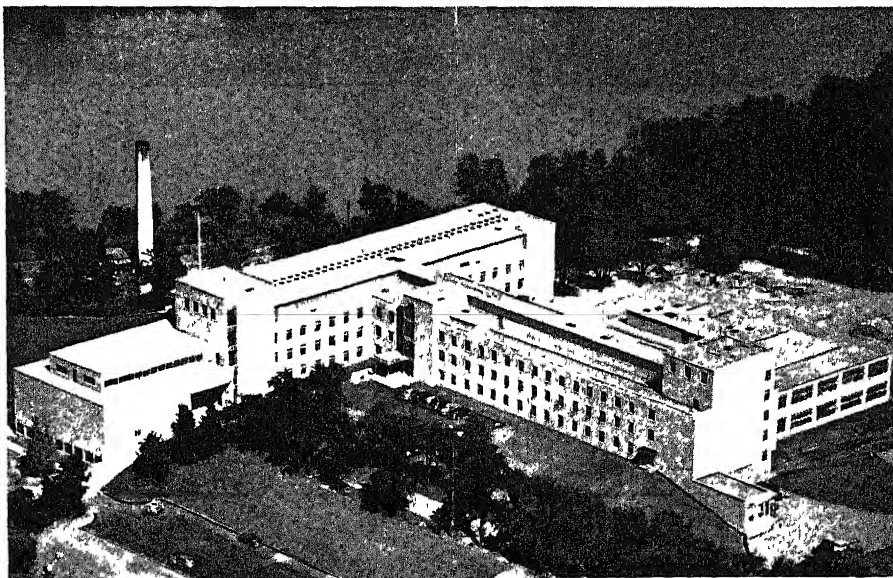
MEDICINE-AERONAUTICS

Ultrasonic Noise Harmless

➤ **THE HIGH** frequency noise of the exhaust of turbo-jet engines has been found not guilty of causing nausea, weakness, irritable disposition and other vague ills. So Dr. Hallowell Davis, expert on hearing of the Central Institute for the Deaf,

St. Louis, Mo., reported to the National Noise Abatement Symposium in Chicago, Ill.

Ultrasonic noise that is beyond the range of your hearing will not hurt you—unless the sound is intense enough to cook a small



HOME OF RESEARCH—The main building of the General Electric Research Laboratory located at the Knolls near Schenectady, N. Y. is shown above. "Universal space" design, provided by ready availability of services and use of movable steel partitions, permits establishment of rooms of any size ranging from six feet to the full length of the building. The four other principal structures are the radiation laboratory, the low-temperature laboratory, a chemical pilot plant and a heating plant.

animal by the heat generated in its fur.

The vague symptoms which you may really feel on exposure to the turbo-jet noise are actually due to the very intense middle and low frequency noise that is also present.

Dr. Davis reported a study of the harmful effects of noise made by Dr. Karl Kryter, director of the Human Resources Research Laboratory at Bolling Air Force Base, under a contract between the Office of Naval Research and the Central Institute for the Deaf.

Steady or expected noises do not interfere with work to any significant extent, it was found. In fact, some evidence was obtained that noise may "insulate" a person from intermittent distractions so that on some tasks, such as aiming a gun, performance is better in noise than in quiet.

The explanation for this is in the ability of the individual to adapt or "get used to" steady noise and to the fact that a person can usually increase his effort, if necessary.

Even in a hospital, the steady hum of an electric fan can prevent patients from complaining about loud voices down the hall, because it masks them so that they are not heard.

Gun fire and other shock or blast waves cause partial deafness that may last for a few minutes or several days and if the noise is repeated this partial deafness may be permanent and may get worse with continued exposure.

Ear plugs can prevent deafness from this kind of loud noise and also improve the hearing of speech in noisy surroundings. Cotton does not give much protection against low and middle frequency noises, but it does cut out the high frequencies which are the most annoying.

The most important effect of noise, Dr. Davis said, is its interference with communication. In situations where teamwork is important, this may be a serious hazard.

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was halted.

The medical scientists also warned that although the rice regimen has an important place in the treatment of severe essential hypertension, it is not, in its present form, a practical method of sustained therapy in most cases.

They pointed out that the diet is extremely unpalatable, monotonous and difficult to maintain long enough to exert its effects.

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SCIENCE NEWS LETTER

VOL. 58 OCTOBER 28, 1950 No. 18

44,300 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W., Washington 6, D. C., North 2255 Edited by WATSON DAVIS.

Subscription rates. 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925, 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to periodical literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STATE 4439.

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MEDICINE

Rice Diet Evaluated

► THE RICE diet for high blood pressure helps patients and has given good results in more than half of one group, but is not in its present form a practical method of continued treatment in most cases.

This, in brief, are the conclusions of a team of medical scientists at Columbia University College of Physicians and Surgeons in New York. Their conclusions are based on results with 50 patients, all of whom were in the hospital throughout the diet test and who for an average of 10 and one-half weeks were given the diet, exactly as prescribed by its originator, Dr. Walter Kempner of Duke University.

The diet consists of an average of almost one pound of rice daily plus white sugar or dextrose and fruit or fruit juice.

The Columbia physicians report in the

AMERICAN JOURNAL OF MEDICINE that they "concur in Dr. Kempner's opinion that this specific diet, if followed with sufficient attention to detail, specifically reduces the blood pressure in a significant proportion of patients with severe essential hypertension."

"It would appear," they stated, "that the effects of the rice diet exceed, under controlled conditions at any rate, any other types of treatment for this disease short of sympathectomy (cutting of the sympathetic nerves in the spinal region). As far as we are able to ascertain, the drop in blood pressure is due chiefly to the very low sodium, or salt, content of the rice diet."

It was emphasized, however, that most of the patients on the strict diet returned to their hypertensive condition once the diet

Question Box

ARCHAEOLOGY

Are the Indians or the Eskimos older? p. 285.

GENERAL SCIENCE

How much would world suicide cost? p. 278.

INVENTION

Why are tacks and tape now obsolete? p. 281.

Photographs: Cover, L. S. Cressman, University of Oregon; p. 275, General Electric; p. 277, New York State Science Service; p. 279, Willys-Overland Motors, Inc.; p. 284, American Red Cross.

MEDICINE-AERONAUTICS

What kind of noise makes one sick? p. 275.

NUTRITION

What will make the Thanksgiving turkeys plumper? p. 280.

SOCIOLOGY

How do class lines extend beyond death? p. 274.

WILDLIFE

What is the most hunted game bird in North America? p. 286.

GENERAL SCIENCE

Draft Test Tough

Although the AFQT is difficult if one finishes in the 45 minutes allowed, it is easy to get enough correct answers to be accepted by the Army.

By MARJORIE VAN DE WATER

► THE induction test given to drafted men is plenty tough. I know because I took it. On the other hand, it would be easy to get the small score required to pass it and get into the Army.

The test I took is the AFQT, Armed Forces Qualification Test, the source of so much controversy recently. Selective Service Director Lewis B. Hershey says that too many men are flunking it. The Army insists that it is no more difficult than is necessary to keep out of the Army men who are so stupid that they would be more dangerous to the Army than the enemy. The test is designed to pass all but the lowest 13% of men drafted.

First you work out two pages of samples. These give you a chance to learn how to mark your answer sheet so that it can be scored by machine, and how to go about solving the problems. These sample questions are answered for you, or you are given the answers by the examiner and have a chance to rub out your answer and put the right one down.

Then, at the signal, you turn the page and start in. You meet a group of questions on the meaning of words. In each case you have to make a choice of one out of four words that is nearest in meaning to an underlined word in a sentence. This was as easy as apple pie for me.

Then came a group of arithmetic questions. These were easy too.

Next were a group of patterns. Here you had to look at a design and choose one out of four drawings that could be folded up to look like the figure given at the left, that could be unfolded to form it, or that could be turned around to match it.

This job was tough for me. The psychologists say that ability on this test is a good index of ability at mechanical work such as that required in the Army.

I dare say that most of the men tested would breeze through these patterns and might have more trouble than I did with the word tests. But my impression was that even if I had been trying to fail them, the chances are I might have passed by accident. I really had to puzzle. In the whole test I missed seven questions and six of them were these patterns.

After a few of these questions on patterns you come to another group of word tests and then another group of arithmetic problems and another set of patterns. This is followed by other groups of these three types of question, each group more diffi-

cult than the preceding in an ever ascending spiral of toughness. If you finish the whole test in the 45 minutes allowed you really reach some brain busters.

But, on the other hand, it is hard to see how any school boy would fail to get enough answers correct to get the score required to be acceptable in the Army. I answered more than two and a half times as many questions correctly as are necessary to pass.

All the representatives of the press who took the test with me received scores that would make them eligible for Officers Candidate School.

I am not going to Officers Candidate School, but, except for the accident of sex and age, I might be on my way.

While we of the press were taking the test, some drafted men who had failed were being interviewed. This is regular procedure to guard against goldbricking. A few of the men were found, on the basis of their answers in the interview, to be clearly malingering on the test. They are going into the Army. A few others were just as clearly incapable of passing. One man left the Army officer in doubt as to whether he was dumb or pretending to be. He was sent back to his local draft board for investigation.

Science News Letter, October 28, 1950

NUTRITION

Beriberi Threat Cut

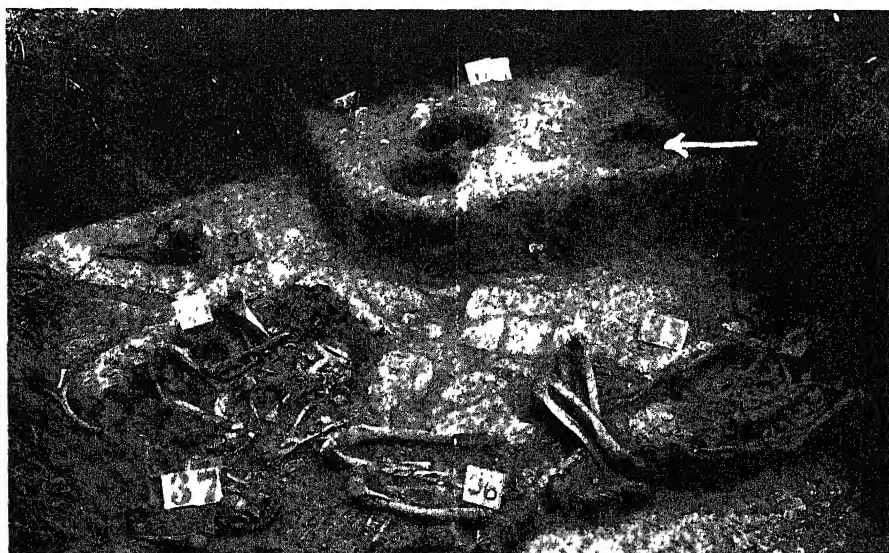
► FOR 1,000,000,000 people of the world's ricelands, a scientific experiment on Bataan Peninsula in the Philippines has offered new hope that the white, polished rice of half the world's diet will not always bring with it the crippling, killing disease called beriberi.

In two years, doctors of the Philippine Government, aided by the U. S. Public Health Service and a private U. S. foundation, the Williams-Waterman Fund, have saved an estimated 220 lives and cut the beriberi mortality rate to zero in at least

one area, by widespread distribution of vitamin-enriched rice.

Nutrition specialists of the United Nations' Food and Agriculture Organization in Washington, although not involved directly in the two-year-old program, said the figures and results released by the Williams-Waterman Fund were "very impressive."

They said nutritional deficiencies of the Far East's rice-based diet have long been considered a top-ranking item on the UN's list of world problems. This year in Ran-



RADIOACTIVE DATING—Charcoal from three hearths (see arrow in right background) dated by the radiocarbon calendar were found to be about 5,000 years old. Taken from the Lamoka Lake site in New York State, these charcoal samples show that fishing and hunting Indians were living in New York State about 3000 B.C., prior to the New Stone Age of western Europe and about the time the Great Pyramids on the Nile were erected.

goon, the Nutrition Committee for South and East Asia recommended that a team of international experts be sent to study the startling results of the experiment on Bataan.

Before it is milled and polished, rice has a coating of bran and germ which contains most of the grain's vitamin and mineral richness. But most Asiatic peoples will not eat unmilled rice. It is a mark of social prestige to eat rice which is white and clean of its natural coat. In addition, rice which has been milled can be stored longer without spoilage.

In parts of India, parboiled rice is eaten, and the beriberi mortality is low. During World War II in Japan, a government order cut down the amount of milling which rice could be given, and with the resultant increase in nutritional value of the rice, beriberi went down.

The third method of fighting rice malnutrition is to "enrich" white rice artificially, by adding a coating of thiamine (vitamin B₁), niacin and iron. This process, developed by the Hoffmann La Roche chemical

corporation in this country, is the basis of the experiment on Bataan.

Dr. Robert R. Williams, a chemist world-famed for his synthesis of vitamin B₁ in the 1930's, got his first lead by observing dramatic beriberi cures from treatment with extracts of ordinary rice bran in the Philippines in 1910. It was the proceeds from the thiamine patent which set up the Williams-Waterman Fund, and it was this fund which initiated the Bataan experiment in 1948.

In an area which had the highest beriberi mortality in the Far East, the conversion to vitamin-enriched rice for 65,000 people dropped the mortality rate 67% in the first year. In a neighboring control area, the rate went up slightly.

Dr. Williams is now on his way around the world with the statistics from the experiment. His aim is to visit each of the major rice-eating nations, showing them what vitamin enrichment has done—and can do—in combatting a major disease of half the world's peoples.

Science News Letter, October 28, 1950

ENTOMOLOGY

Tough Insects Being Bred

➤ CANADIAN scientists in a Dominion laboratory in Belleville, Ont., are trying to breed tough new strains of the world's "good" insects—insects which benefit man and can laugh at DDT.

What this could mean to the farmer is startling. He could release super honey bees to pollinate his crops or super-parasites to attack destructive caterpillars. At the same time he could spray his fields with insecticides, knowing the harmful insects would be killed but not the friendly insects.

Resistance to chemical poisons is not a new thing in the insect world. Only a short time after DDT was first used in World War II science began reporting mosquitos, flies and other pests which seemed immune to it.

The possibility of breeding this resistance into beneficial insects has already brought

new knowledge of DDT and benzene hexachloride, another insecticide in the same chemical family.

Dr. D. P. Pielou of the Dominion Parasite Laboratory describes in the journal *SCIENCE* (Oct. 6) how crystals of these chemicals are laid on glass plates in extremely thin films used for the experiments.

The pure DDT crystals, left as a solution evaporates, appear under the microscopes like pine needles against a bank of snow. Benzene hexachloride crystals form a lattice of horizontals and verticals.

These kaleidoscopes of poison crystals enable the scientists to give ether-drugged insects precise doses of the insecticides. If the experiments are successful, they may some day produce "good" insects with iron constitutions as good as gas masks.

Science News Letter, October 28, 1950

GENERAL SCIENCE

Price of World Suicide

➤ THE PRICE of world suicide is about \$40,000,000,000 and the work of a few years by a major power. And even then the money and time might be wasted.

This is the conclusion of Dr. James R. Arnold, member of the staff of the Institute for Nuclear Studies at the University of Chicago, who examined a recent statement by Dr. Leo Szilard, the A-bomb scientist, that a hydrogen bomb could be built which would wipe human life off the earth with radioactivity. Dr. Arnold's conclusions appear in the *BULLETIN OF THE ATOMIC SCIENTISTS* (Oct.)

Dr. Szilard declared, in a broadcast last February, that a huge hydrogen bomb with a casing of cobalt could produce trillions of fine particles of radioactive dust. This dust, he said, if spread by the winds evenly over the face of the earth, could kill every human being.

Dr. Arnold concludes that it would take a bomb ranging in size from one-quarter as big as the 40,000-ton battleship *Missouri* to two-and-a-half times the size of the *Big Mo* to do the job. Even then, he says, it is a question whether the neutrons produced by the fusion of the heavy hydrogen in the

bomb would be absorbed by the cobalt so as to give rise to a dangerous radioactive isotope.

However, if that happened, he goes on, Dr. Szilard's assumption that the cobalt dust could be effectively distributed around the earth in the atmosphere is incorrect. Dr. Arnold says that the particles could be rained out of the atmosphere, or made harmless by other natural means before they spread evenly.

Dr. Arnold concludes that the world is in no immediate danger. He and Dr. Szilard agree that it would be much harder to build a bomb of the type that would confine its horror to one continent than it would be to build an indiscriminating bomb.

Science News Letter, October 28, 1950

On This Week's Cover

➤ DATING the remains of ancient cultures by means of radioactive carbon is a direct product of the atomic age, and this method has found the sandals shown on this week's cover of *SCIENCE NEWS LETTER* to be the oldest articles associated with man in America. Approximately 9,000 years old, the sandals were woven and worn by the ancient Americans around 7000 B.C., thereby antedating the oldest agricultural village in Iraq, which dates back to 5000 B.C. (See *SNL*, p. 285, this issue and p. 243, Oct. 14, for more on radiocarbon calendar.)

Science News Letter, October 28, 1950

MATHEMATICS-ENGINEERING

Low-Cost Computer Permits More Use

➤ LOW-COST electronic computers, costing less than \$5,000 each, are now in use in Seattle in several departments of the Boeing Airplane Company solving aviation dynamic problems in a week that would require a year by older methods.

There are now many types of electronic computers, often called giant brains, in use throughout the nation but most of them are costly and complicated devices that must be used in computing centers. This new type is cheap and simple enough to be used in individual engineering rooms where problems in dynamics are solved. A competent engineer in dynamics can learn to operate it in one day.

The new instrument, nicknamed BEAC for Boeing Electronic Analogue Computer, is a simplified form of a large analogue computer put into service a year or so ago. The parent device solves problems relative to how a proposed plane or missile will behave in the air even before actual construction begins. The BEAC is so simple that it is described as a companion instrument to the slide rule.

Science News Letter, October 28, 1950

ASTRONOMY

'50 Astronomy Highlights

The flare-up of Proxima Centauri, the fifth star known to have such flares has been found to flare 50 times in the last quarter of a century.

► THE TOP ten astronomical highlights for the year 1950 have just been picked by Dr. Harlow Shapley, director of Harvard College Observatory:

1. Discovery that Proxima Centauri, star nearest to the earth, from time to time shoots out such terrific geysers of flaming gases from its surface that within a few minutes its brightness is doubled, then in less than a half hour its total light returns to normal. Fifty such flare-ups within the past 25 years have been caught on plates at Harvard College Observatory. This brings to five the number of stars known to have flares similar to those on our sun.

2. Plans for the world's highest astronomical observatory, to be so high the building will be pressurized and observers will live 5,000 feet nearer sea level. To be built under the auspices of the Indian Government, this observatory will be in the Himalayas, three miles above sea level.

3. Correction of the distance from the earth to the sun, and of the earth's path through space as well as more accurate calculation of the mass of the planets Mars, Venus, Mercury and earth-moon. These values were made possible through use of a new, more accurate path for the asteroid

Eros, the orbit of which Dr Eugene Rabe of Cincinnati Observatory obtained by analyzing observations of the past 30 years with a punch-card machine.

4. Finding of the Chubb meteor crater, larger than any previously known, in Quebec, Canada. Only partially explored, this crater's diameter is two and a half miles, or over three times as great as that of the meteor crater in Arizona.

5. Increasing to 50 the number of radio stars known to broadcast the static picked up here on earth with microwave instruments. Credit for this goes chiefly to British and Australian observers.

6. Successful photographs with the new two-mirror, Schmidt-type astronomical telescope at the Mills Observatory in Dundee, Scotland. This telescope, property of St. Andrews University, is the first of its type to go into operation.

7. Accurate measuring of Pluto, most distant of the planets, placing it as the second smallest planet and only 3,550 miles across. Dr. Gerald P. Kuiper of the University of Chicago's Yerkes Observatory took the all-important photographs with the 200-inch telescope while a guest of Palomar Observatory.

8. Determination with highest accuracy of the colors and luminosity of near-by stars by Dr. Olin J. Eggen of Lick Observatory. This work is highly significant in the study of the evolution of stars.

9. Great smog, caused by forest fires in Alberta, Canada, giving the sun a blue hue in Canada and here in the United States interfering with observations of a total lunar eclipse.

10. Hundredth anniversary of the first astronomical photograph, picture of the bright star Vega made with Harvard's 15-inch reflector with daguerreotype process.

Science News Letter, October 28, 1950

AERONAUTICS

Jeep Carries Generator To Start Jet Engines

► THE PROBLEM of starting the engines of jet-propelled airplanes on naval carrier vessels is solved with the development of a three-wheel, low-down "jeep" which carries an electric generator for starting the engines.

Jet-propelled planes, for the most part, are dependent on an outside source of electric power to start the engines. Storage batteries, such as are used in automobiles, are unsatisfactory because of the weight that would be required. Several types of self-contained self-starters have been proposed and some developed. But outside power is still used in most cases.

This special automobile, developed in Philadelphia by O. E. Szekeley and Associates, is based on the Willys-Overland jeep. Being a three-wheel affair, it can turn a right angle corner and circle about in a very small space. Being only 36 inches high, it can pass with ease under the wings of planes on carrier flight decks.

Science News Letter, October 28, 1950

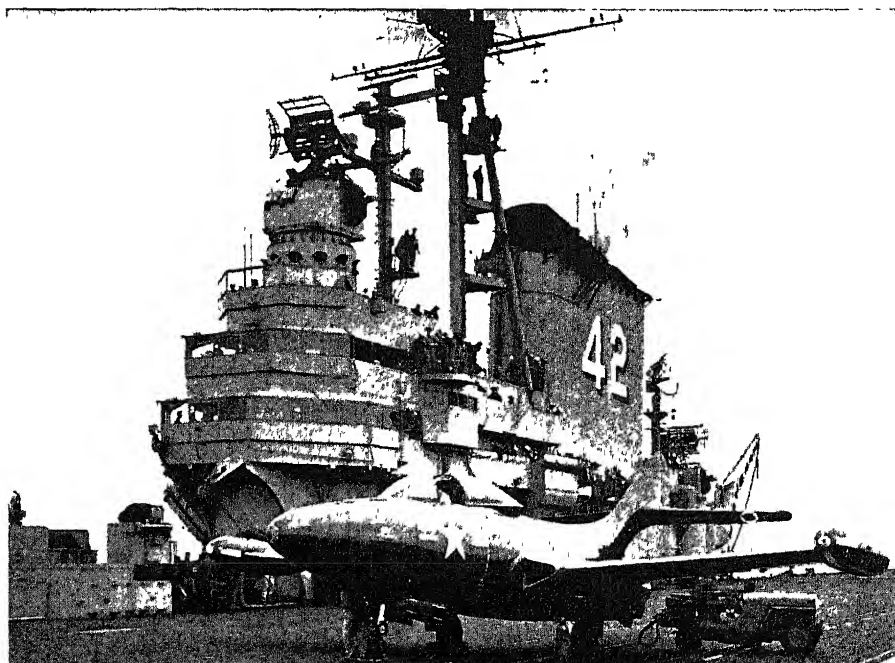
INVENTION

Sugar Made without Molasses By-Product

► MANUFACTURING white sugar without molasses as a by-product is promised by a process for which John Paul Bartz, Fort Lauderdale, Fla., was awarded patent 2,526,111. The sugar may be made from juices of sugar cane, sugar beets and citrus fruits. The product is claimed to have superior sweetening and improved nutritional properties as well as reduced fattening qualities.

The process is complicated from the layman's standpoint, but it includes the treatment of sugar-bearing fluids and juices by chemical and ion exchange methods. These remove salts present in the liquids and the excess of undesirable gums, pectins, dextrins and proteins. Coloring matter is removed by activated charcoal or bone char. The aqueous sugar solution is then concentrated into crystalline or powdered sugar or into liquid sugar.

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TRICYCLE JEEP—The tricycle-geared jeep is nimble as a cat, turning in a circle which has a 7-foot radius. Used to energize jet aircraft and military planes, it is also valuable for towing disabled planes out of the line of flight traffic.

MEDICINE

Chemicals Substitute for Blood Plasma in Shock

➤ **GOOD** results in peacetime use of three chemicals developed as blood plasma substitutes during World War II are reported by Dr. John S. Lundy and colleagues of the section on anesthesia of the Mayo Clinic in Rochester, Minn.

The three chemicals are dextran, periston and a solution of gelatin. Dr. Lundy has been using dextran since April, 1946. Up to the first of this year, it has been given to about 1,500 patients for fall in blood pressure, termed mild or marked "shock," during operations or while under an anesthetic. In five or six cases it was considered of life-saving importance, having helped patients who had not benefitted from several transfusions of blood.

Dextran is a Swedish-developed chemical, a by-product of sugar manufacture.

Periston, which the Mayo scientists obtained from British-occupied Germany and from manufacturers in this country, is a solution of polyvinyl pyrrolidone. The periston used during World War II was a 2.5% solution which "did not make much of an impression." Results now being obtained with a 3.5% solution are so much better that it does not seem possible it is the same chemical, the scientists reported at a staff meeting at the clinic.

Science News Letter, October 28, 1950

SAFETY

Automatic Breathing Apparatus Versatile

➤ **IMPROVED** automatic breathing apparatus, for use in accidents, has been developed in Pittsburgh, Pa., by the Mine Safety Appliances Company. Police and fire departments, ambulance crews, hospitals and industrial-plant safety staff could be equipped with it.

It is intended for use in drownings, electric shocks and all kinds of asphyxiation, and is suitable for use even on newly-born babies.

The name "Pneolator" has been coined for it. Its uses require only short training.

The device includes a rubber and plastic mouthpiece connected to two valves by four-foot lengths of rubber. One of the valves administers oxygen, from a holding tank, with positive pressure at regular intervals. The other valve lets oxygen flow only when the patient inhales and stops the flow when the patient exhales. The valves are arranged so that they interchange automatically, depending upon whether or not the patient is breathing.

The artificial respiration valve delivers oxygen to the lungs of a victim whose breathing has stopped. It does not suck air from the lungs, however. When the proper amount of oxygen has been admitted into the lungs, the valve shuts off. The elastic

walls of the lungs and the flexible muscles of the diaphragm and chest cause exhalation.

Automatic intermittent positive pressure breathing was first developed during World War II at the aero-medical laboratories of the Air Force, Wright Field, Dayton, Ohio. The differential pressure instrument was designed to sustain breathing of injured airmen at high altitudes.

This new artificial respiration apparatus is unlike others in several respects. Principal among these is that the pressure of the oxygen administered by the cycling valve can be varied to meet a wide range of conditions. The valve can be set from a very gentle low pressure up to a little over normal atmospheric pressure.

Science News Letter, October 28, 1950

AERONAUTICS

Agreement Helps British Sell Airplanes in America

➤ **INCREASING** sales of British planes in the United States are expected in London as a result of a recent agreement under which American governmental authorities will accept the British Certificate of Airworthiness as equivalent to the certificate issued by the United States.

The result is that no technical obstacles now exist to the import of British aircraft into America. In 1934, the British and the United States governments each agreed to recognize the other's certificate of airworthiness. But by 1945, the Americans had added so many additional qualifications to the English certificate that the agreement became unworkable. The United Kingdom, however, continued to accept the American certificate.

In January 1949, both nations agreed to the international airworthiness requirements of the International Civil Aviation Organization which has representatives of over 50 nations. But the American government maintained its insistence that all aircraft flown within the United States must conform to the American national standards.

Credit for the new agreement belongs to a British delegation, headed by R. E. Hardingham of the Ministry of Civil Aviation, and representatives of the American government headed by D. W. Rentzel, then director of the Civil Aeronautics Administration but now chairman of the Civil Aeronautics Board. The meeting of the two groups was held in the United States during the past summer.

American acceptance of British aircraft certification is good news to the British aviation industry who expect to make more sales in the United States as a result. It is good news to the British government also, because sales to America means dollars, and "dollar markets" rank high in the present British economy.

Science News Letter, October 28, 1950



DENTISTRY

Fluorine Chemical Cuts Caries Prevention Cost

➤ **A CUT** of almost two-thirds in the cost of efforts to prevent tooth decay by putting fluorine into drinking water may result from a discovery by Dr. F. J. McClure of the National Institute of Dental Research, U. S. Public Health Service, Washington.

Sodium fluoride is the chemical now being added to the water supply in many communities in the hope of cutting down on tooth decay. But another, cheaper fluorine compound, sodium fluosilicate, may be just as effective, Dr. McClure's experiments with growing rats show.

Sodium fluosilicate is not only cheaper but contains more fluorine, so less of it needs to be used, thus cutting the cost still further.

Sodium fluosilicate now costs about four and one-half cents a pound. Sodium fluoride costs about 10 cents a pound. Cost of all chemicals for fluoridation of a million gallons of water using sodium fluoride is about \$2.15. Using an equivalent amount of sodium fluosilicate, the cost would be about 76 cents.

Although scientists do not yet know exactly how valuable fluoridation of water supplies may be for preventing tooth decay, preliminary reports from several of 50 cities now testing the method show that tooth decay in children in these cities has been reduced as much as 40% to 50%.

The fluoridation method of trying to prevent tooth decay results from earlier research by Dr. H. Trendley Dean, director of the National Institute for Dental Research.

Science News Letter, October 28, 1950

NUTRITION

Plumper Thanksgiving Turkeys Due to Hormones

➤ **YOUR** Thanksgiving turkey may be plumper this year because of synthetic hormones. Scientists at the North Dakota Agricultural Experiment Station in Fargo, N. D., have tried "chemical caponizing" on turkey hens and found it works.

A chemical called diethyl stilbestrol is coming into widespread use among chicken growers to keep young cockerels from developing the muscular attributes of tough old roosters. It has the effect of caponization without surgery, making the meat more tender.

Kermit F. Schlamb and Reece L. Bryant, poultry husbandmen, tried the chemical on turkey breeder hens. They report successful boosting of the birds' weight and marketability.

Science News Letter, October 28, 1950

THE FIELDS

INVENTION

Magnetic Disks Make Tape and Tacks Obsolete

► **ROUND** magnetic disks that hold tight to steel walls have made thumbtacks and scotch tape obsolete in the new General Electric Research Laboratories. When notices are posted or direction signs are installed, they are held up by the small alnico magnets that stick tightly to the steel sheets covering the walls.

Even name plates for offices and laboratories are fastened magnetically. It only takes a flick of the wrist to change a name. If scientists and engineers were hired and fired as speedily as Hollywood writers, the magnetic name plates would save much money and trouble.

Hats and even light raincoats can be hung up anywhere by use of the little magnetic fasteners.

Science News Letter, October 28, 1950

INVENTION

Natural Color Gum Cleans Teeth, Sweetens Breath

► **CLEAN** teeth and sweet breath are promised with a chewing gum containing dentifrices on which a patent was issued by the government recently.

The idea is not entirely new. Other chewing gums include teeth-cleaning ingredients and breath sweeteners, but they usually are black because of powdered charcoal in them. White gum is said to be the preferred type by constant chewers. This new product has a natural color.

This product contains the usual ingredients of standard chewing gums to which is added about 10% of a finely divided mixture of 90% silica and 10% alumina treated with methyl chlorsilanes. Kenneth K. Kearby, Cranford, N. J., is the inventor. Patent awarded is 2,525,072. It has been assigned to the Standard Oil Development Company.

Science News Letter, October 28, 1950

NUTRITION

Paraplegic Veterans Now Eating Better

► **PARAPLEGIC** veterans in New Jersey are eating better today than they were a year and a half ago, thanks to regular home visits from a dietitian who has been added to the team of doctors looking after these men under the New Jersey Paraplegic Veterans' Program.

A large number of the patients were suffering from "hidden hunger" when the dietitian, Miss Winifred C. Duffy, first

began her work with them, she reported to the American Dietetic Association meeting.

Lack of knowledge of good nutrition, rather than lack of funds, was the reason in many cases. One patient, Miss Duffy reported, was "practically skin and bones and always fatigued." He lived alone and did his own cooking. He needed to be taught much about food values and methods of preparing foods. In a few months, he gained weight and was very appreciative of the services given him by the dietitian.

All the patients believed they had to drink beer, Miss Duffy found. It was explained to them that they should drink at least three quarts of fluids a day, but that they should also eat a good basic diet.

Many ate only one meal a day because they had trouble keeping down to their proper weight. One patient ate only sandwiches. Some were actually undernourished.

Some of their strange ideas about diet, Miss Duffy explained, came probably from the fact that before World War II very little was known about paraplegics and even physicians had much to learn about the best care for them.

In general, the patients were encouraged to eat three meals a day, high in protein and vitamins and low in calories and oxalates. These last two provisions are because of the tendency to put on weight and develop kidney stones through lack of physical activity.

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AERONAUTICS

Omnirange Guides Planes Of U. S. First Airways

► **SOME** 4,380 miles of airways equipped with the new-type radio guidance system known as omnirange are now in operation, the Civil Aeronautics Administration announced recently. The system is finally to blanket the entire United States.

Ground stations equipped with omnirange send out signals in all directions to guide airplane pilots. The radio ranges which it is replacing send signals in only four directions. In addition, omniranges use very high frequency radio signals with which "static" does not interfere. This means pilots will be able to receive clear signals at all times in spite of storms or other interference with radio transmission.

Some 400 omnirange stations will be finally in use to blanket the entire country with the omnirange system. Along the airways now in operation on omnirange beams are 41 stations. The airways connect Kansas City, Denver and Albuquerque. Others connect Omaha, Wichita, Tulsa, Oklahoma City, Fort Worth and El Paso. A total of 271 omniranges have been commissioned by the CAA. But others will be necessary before definite omnirange airways will be available.

Science News Letter, October 28, 1950

NUTRITION

Old People in Homes for Aged May Not Get Vitamins

► **GRANDPA** and Grandma need their vitamins but it is doubtful whether they get them when they are living in homes or other institutions for the aged.

Only nine of 21 states employ dietitians in homes for the aged to plan meals for the 75,000 or more old people living in these institutions, Mrs. Vera M. Walker, of the Florida State Welfare Board, found in a survey undertaken for the American Dietetic Association.

Where there is no dietitian, food service is the responsibility of almost anyone. a cook, manager, superintendent, matron, operator, proprietor, licensee where the homes are licensed by some state agency, a "woman with cooking experience," or a nurse.

If a special diet is required, as for a diabetic, it is prescribed by a physician. His orders are carried out by a nurse, the operator, the manager, the matron, the cook or the person in charge.

"A large but unknown number of senior citizens" are living in homes for the aged, including boarding homes, nursing homes, county or town farms, convalescent homes, rest homes, infirmaries and other types of institutions, the survey showed.

In the light of our modern knowledge of the great importance of proper food in the care, treatment and rehabilitation of the aged and chronically ill, dietitians, Mrs. Walker declared, will feel "deep concern" that no greater care is taken for provision of adequate and proper food for the residents and staff of institutions for the aged.

She recommended, in her report to the American Dietetic Association meeting in Washington, that wherever possible arrangements be made for regular, planned consulting service by dietitians to operators of homes for the aged.

Science News Letter, October 28, 1950

GENERAL SCIENCE

Lasker Planned Parenthood Award to Mrs. Sanger

► **MRS.** Margaret Sanger, internationally known leader of birth control movement, and Dr. Bessie L. Moses of Baltimore, obstetrician and medical director of the Bureau for Contraceptive Advice since she founded it in 1927, received the Lasker Foundation Awards in Planned Parenthood for 1950.

They are the first two women to receive these awards which previously have been given to seven men.

The usual \$500 cash award has been doubled for Mrs. Sanger because of her "long untiring service in a cause which has become synonymous with her name."

Science News Letter, October 28, 1950

ASTRONOMY

Orion Enters Fall Skies

The celestial warrior can be seen in the east on November evenings. Jupiter is visible, and the planet Saturn may be seen late at night.

By JAMES STOKLEY

► FOR the first time since April, our maps of the evening skies show the constellation of Orion, the warrior. With the possible exception of the Great Bear, Ursa Major, of which the big dipper is a part, Orion is probably the most familiar of constellations.

On winter evenings it stands high in the south, with the three stars in a row that mark the warrior's belt and the collection of bright stars around it all combining to make it conspicuous.

At the times for which the accompanying maps are prepared (10.00 p.m. standard time on Nov. 1, an hour earlier on the 15th and two hours earlier at the end of the month), Orion is just appearing above the eastern horizon, with the belt stars forming a vertical row. To the left is Betelgeuse, marking one of Orion's shoulders. Rigel, in one of his legs, is to the right, for as we now see him, he is on his back. But as we watch him climbing higher and higher with the passage of time, he straightens into an upright position.

Taurus, the Bull

Above Orion is Taurus, the bull, with the bright and ruddy star Aldebaran. Taurus gazes balefully towards Orion, who according to the old pictures that used to be drawn around the stars, is represented with an upraised club as protection from the charging beast.

Toward the northeastern horizon, to the left of Orion, are Gemini, the twins, the brightest star of which is called Pollux. Above this group we find Auriga, the charioteer, with still another star of the first magnitude, named Capella.

Another aggregation of first-magnitude stars can be seen toward the west, but these are not bright orbs of the winter just making their entrance on the celestial stage. Three, at least, are stars that were conspicuous on summer evenings, now making their last bow before leaving our sight for several months.

Brightest of these is Vega, in Lyra, the lyre, in the northwest. Above it is the Northern Cross, now upright and with Deneb at the top. This cross is part of Cygnus, the swan. Directly west is another heavenly bird, Aquila, the eagle, of which Altair is the brightest star. Vega, Deneb, Altair—these are the three stars that shone so brilliantly overhead on evenings of late summer.

The last of the eight brightest stars now seen is one that belongs to the far southern constellation of Piscis Austrinus, the southern fish. It is called Fomalhaut and comes into view for a few months about early autumn. It now shows in the southwest.

Jupiter in South

But a little above and to the right of Fomalhaut is a far brighter object, the only planet easily visible at this time. It is Jupiter, whose motion around the sky, taking 12 years to complete, has now brought it into the constellation of Aquarius, the water carrier. At sunset Jupiter is high in the south; it sets in the west about midnight.

One other planet can be seen earlier, in the west. This is Mars, which sets about two and a half hours after the sun. Now approaching the part of its orbit farthest from the earth on the opposite side of the sun, which it will reach next spring, it is increasing in distance and getting fainter. However, it is still equal in brightness to a star of the first magnitude. Because it is moving rapidly through the sky toward the east, for the next couple of months it will continue to set about as long after sunset as it does at present.

Late at night the planet Saturn may be seen, in the constellation of Virgo, the virgin, rising about four hours ahead of the sun. Both Mercury and Venus are now so nearly in line with the sun that they are not visible.

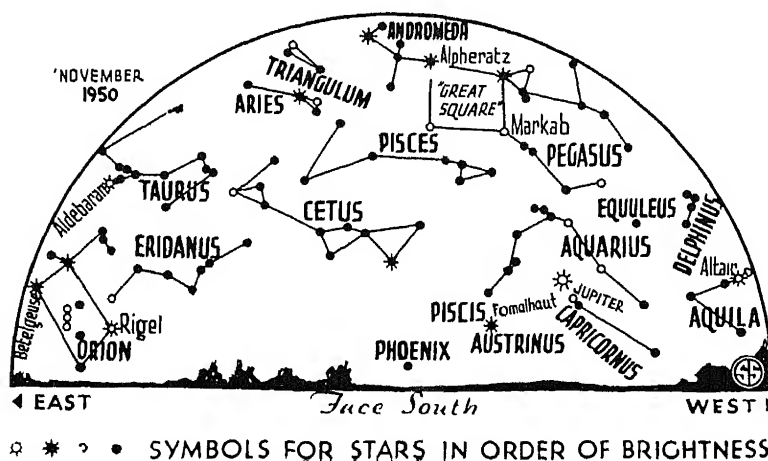
A less conspicuous but nevertheless important constellation—one that is now best for evening viewing—is Andromeda, the chained princess. This constellation is directly overhead at the times for which our maps are prepared. Below her, toward the northern horizon, is her mother Cassiopeia. To the left and a little lower in the sky, as measured from the queen, is the King, Cepheus. To the right is Perseus, the great champion who, in the mythological story, rescued Andromeda from the monster who was about to devour her.

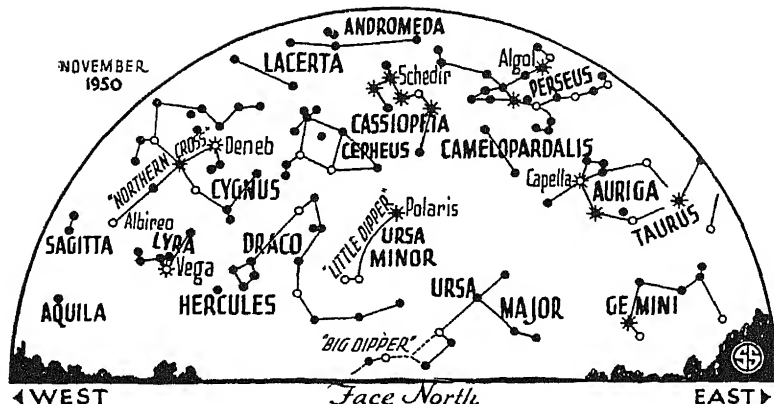
In Perseus, incidentally, is the curious star Algol, the original Arabic name of which means "the demon." Algol is one of the numerous binary stars. These, though they look like a single body, really consist of two globes revolving around the center of the system. In the case of Algol it happens that one of the stars is much fainter than the other and that the plane in which they revolve is nearly in the direction of the earth.

Revolutions of Algol

Thus every revolution, which takes two days and 21 hours, the dark one partially eclipses the bright one and the object we see in the sky gets fainter. In five hours it loses some two-thirds of its light. Then in the next five hours it returns to normal brilliance, that of a typical second-magnitude star. It is interesting to watch Algol night after night. The celestial time-table at the end of this article gives the times during the month at which the minimum brightness is reached during evening hours.

The distance of Algol from the solar system is such that its light, travelling 186,000 miles every second, takes about a century to reach us. And from the changes that occur in its light, astronomers have





used to track down the primary cosmic ray particles continuously bombarding the earth from somewhere in space. Instruments must go beyond the heavy atmospheric blanket surrounding the earth to catch these primary rays. Below this blanket, only secondary particles are recorded.

Science News Letter, October 28, 1950

MEDICINE

Streptomycin Chief One Of 38 Anti-TB Chemicals

➤ SCIENTISTS have discovered 38 chemicals produced by molds, bacteria and fungi which are active against the tuberculosis germ, Dr. Selman A. Waksman of Rutgers University declared at the third annual meeting of the Detroit Institute for Cancer Research.

Streptomycin, however, is the only one of the 38 which is extensively used in the treatment of tuberculosis. The others are either too weakly active against the TB germs or too toxic to the human body or too new to be used in treatment of the disease.

Streptomycin is not always curative, especially in the more common types of tuberculosis of the lungs. Its value as a remedy is also limited by development of resistance to it on the part of disease germs and by the fact that it sometimes causes disturbances in the hearing mechanism.

The most significant contribution of streptomycin, Dr. Waksman said, is that it opened a way to the treatment of tuberculosis by chemicals and showed that chemical treatment of this disease, as in the case of most other germ-caused diseases, is possible.

Science News Letter, October 28, 1950

been able to learn a considerable amount of data about the two bodies. The brighter member of the pair is 312 times the diameter of the sun, which makes it some 2,670,000 miles. The fainter star is a little larger, 368 solar diameters, or 3,180,000 miles. Their centers are 6,520,000 miles apart. The brighter is 160 times the luminosity of the sun, while the fainter is only 13 times the sun's brilliance. But even this is not the whole story, for there is a third star in the system, around which the eclipsing pair revolves every 1.9 years.

Time Table for November

Nov.	EST	
1	12 00 noon	Mercury on far side of sun
2	8 00 p. m.	Moon in last quarter
6	1 38 p. m.	Moon passes Saturn
9	6 25 p. m.	New moon
10	8 00 a. m.	Moon nearest, distance 222,000 miles
12	10 34 p. m.	Moon passes Mars
13	12 39 a. m.	Algol at minimum
	6 00 p. m.	Venus on far side of sun
15	9 28 p. m.	Algol at minimum
16	early a. m.	Meteors visible radiating from constellation of Leo
	10 06 a. m.	Moon in first quarter
	6 03 p. m.	Moon passes Jupiter
18	6 17 p. m.	Algol at minimum
24	10 14 a. m.	Full moon
	7 00 p. m.	Moon farthest, distance 252,600 miles

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, October 28, 1950

NUCLEAR PHYSICS

Largest Plastic Balloon Tracks Cosmic Particles

➤ THE LARGEST plastic balloon ever made, capable of carrying twice the instrument load of previous models, has soared over 20 miles above the earth.

Large light balloons are a valuable aid in learning more about the secrets of cosmic rays, believed to hold the key to many atomic mysteries.

Made of extremely thin strips of polyethylene, a plastic coming into wide use for packaging, the extra large size balloon resulted from the use of special tapes to bind the plastic strips.

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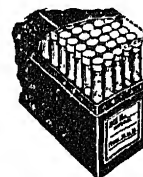
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MEDICINE

Air for "Suffocation" Victims

Breathing is the second item to check after bleeding. Artificial respiration may save a life between the interval when breathing stops and the heart stops.

By JANE STAFFORD

Fifth in a series of atomic first aid.

► **DIFFICULT** breathing or stoppage of breathing is the second thing you look for, after serious bleeding, when you are called on to give first aid. Oxygen from the air is essential to life. Anything interfering with or cutting off the oxygen supply seriously threatens life.

Certain cells in the brain die within four minutes if deprived of oxygen. The heart may continue beating for a short time after breathing stops. During this interval before the heart stops, you may be able to save life by giving artificial respiration.

Hands Always Available

Mechanical devices such as inhalators and respirators are often used to restore breathing in cases of suffocation. But these are not always immediately available and the victim may die before they can be gotten to him.

You have a pair of hands and that is all you need to give artificial respiration. Here are directions for the standard method:

1. Lay the patient on his belly, one arm extended directly overhead, the other arm bent at elbow with the face turned outward and resting on hand or forearm. Nose and mouth must be free for breathing.

Straddle Patient

2. Kneel straddling the patient's thighs with your knees at such a distance from his hip bones as will allow you to place your hands as follows: Palms of your hands on the small of the patient's back, fingers resting on the ribs, little fingers just touching the lowest ribs. Thumbs and fingers should be in a natural position with the tips of the fingers just out of sight.

3. With your arms straight, swing forward slowly so that the weight of your body

is gradually brought to bear on the patient. Your shoulder should be directly over the heel of your hand at the end of the forward swing. Do not bend your elbows. This forward swing should take about two seconds.

4. Immediately swing backward so as to remove the pressure completely.

Repeat Double Movement

5. After two seconds, swing forward again. Repeat deliberately 12 to 15 times a minute the double movement of compression and release.

6. Continue artificial respiration without interruption until natural breathing is restored or until a physician pronounces the patient dead. You may have to continue it for four hours or longer.

7. As soon as artificial respiration has been started and while it is being continued, have an assistant loosen any tight clothing about the patient's neck, chest and waist.

Keep the patient warm. Do not give any liquids by mouth until he is fully conscious.

After he revives, keep him lying down to avoid strain on the heart.

Watch the patient, because sometimes after natural breathing has started it stops again. Artificial respiration must then be re-started immediately.

If it is necessary to change operators while giving artificial respiration, do it without losing the rhythm of the procedure.

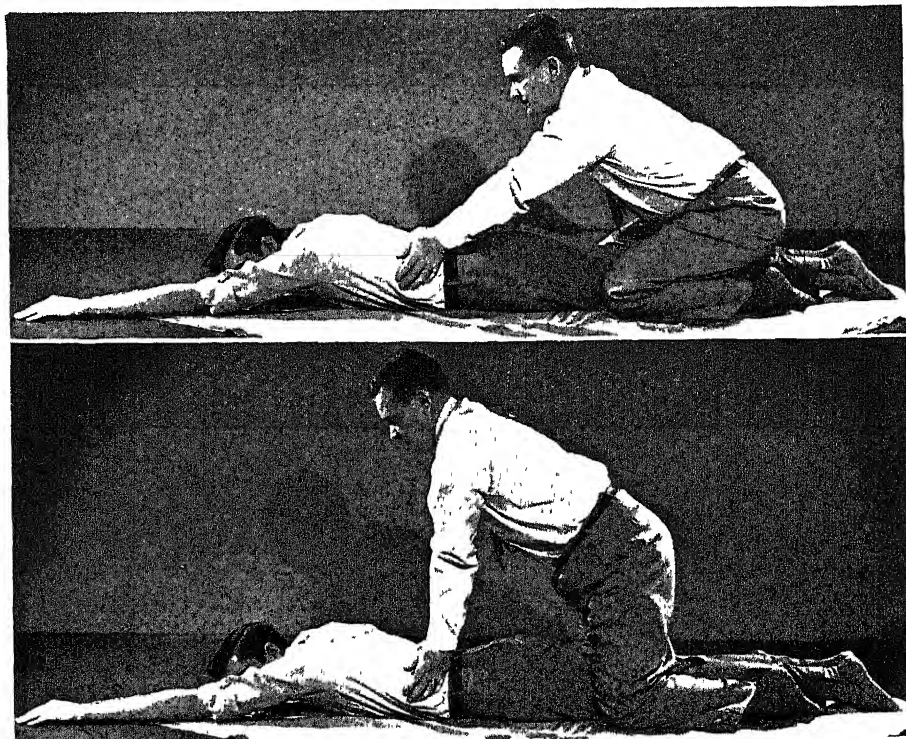
Sign of Revival

Signs that the patient is being revived by artificial respiration are a fading of the bluish color of the skin and, in fair-skinned persons, a flush of color; twitching of the mouth and "creeping" of the fingertips; and, most encouraging, a sobbing catch of the breath while air is being taken into the lungs.

Uses Are Many

Most people think of artificial respiration for victims of drowning, gas poisoning and electric shock. Other conditions in which you may need to give it are: compression of the chest, as by the cave-in of buildings, prolonged exposure to the cold, poisoning by sleeping medicines, excessive alcohol, hanging in attempted suicides, choking and puncture wounds of the chest.

Science News Letter, October 28, 1950



AIR FOR LIFE—Forward and back positions of the standard artificial respiration technique are shown.

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ARCHAEOLOGY

Indians Antedate Eskimos

➤ THERE were Indians living in the United States long before the first Eskimos of the North American continent.

This revolutionary finding, completely reversing the long-held opinion that the Eskimos came first and the Indians were derived from them, was presented to the National Academy of Sciences meeting in Schenectady, N. Y., at the new General Electric laboratory by Dr. William A. Ritchie, archaeologist for the State of New York at Albany.



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Eskimo culture, as shown by radioactive carbon dates, is "immensely younger" than that of the early Indians of New York and other parts of the United States, Dr. Ritchie reported. The radioactive carbon dates were determined through the radiocarbon atomic calendar which Dr. William F. Libby of the University of Chicago reported to the Academy meeting.

The Eskimos are not older than about 1,000 years. Pre-Indians of New York State lived there at least 5,000 years ago. Some Eskimo culture was derived from those early Indians.

Dr. Ritchie's finding does not change the idea that America was populated from Asia via the Bering straits. It does mean that these first Americans came over the Bering straits much earlier than the Eskimos as we know them now and as they are known from the earliest archaeological evidence.

The radiocarbon dates for the Eskimos and the earlier Indians were set from radioactive carbon found in remains of things used by these peoples, and from bones and the charcoal of their fires.

Science News Letter, October 28, 1950

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Quail

➤ MORE quail fall victim to chilled lead shot each autumn than any other game bird in North America. Hunted by man as well as by dogs, cats, foxes, skunks, weasels, snakes, great horned owls and sharp-eyed hawks, it is small wonder that the bobwhite has an exceedingly suspicious disposition. When the harvest moon is full over the shocked corn, this plump little field-dweller with the bombshell takeoff knows that the season of terror has returned.

Yet somehow the bobwhite will refuse again to be exterminated. The survival of American quail through the period of care-free market hunting into the present era of legal protection is one of the biological miracles of the Age of Gunpowder.

Not only in wild and out-of-the-way places does the quail still live, but all along the fence-rows of busy farms, even on the edges of cities. It is almost as if bobwhite knew how important he is to the insect-bedecked farmers of the nation, and what a boon to humans who suffer from hayfever.

Bobwhites are so valuable as destroyers of weed seeds and insects that they deserve even more protection than they get. At one sitting a bird has been known to consume a thousand ragweed seeds. Another had eaten 5,000 seeds of foxtail grass, and a third fully 10,000 of the tiny seeds of the pigweed. And this is but the starch in the bobwhite diet, his meals contain so many injurious insects that he is worth many a quart of poison spray in a field.

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But man, being perverse, continues to reason in this fashion: In the summer, grasshoppers ate our grain. Bobwhites ate the grasshoppers. Now we eat the bobwhites.

Quail are ground-loving birds, and seldom venture very far by air. They have a strong nesting and breeding urge, and when allowed to stick to business, average 14 offspring each year. To keep these large families firmly in tow, they have a wide repertoire of calls, shifting from tenderness to belligerency according to their mood. By means of the familiar whistling "bob . . . white" they attract their mates. The ringing "scatter call" keeps the coveys from wandering too far. A sharp "toil-ick, ick, ick" sounds the alarm when danger is near.

In escaping an enemy, bobwhite relies more on camouflage and the cover of tangled brush than upon breaking for the wild blue yonder. He would rather run than fly. But when discovery is imminent, a covey will burst from cover with a great "whurr" of their wings, scattering in all directions at 30 to 40 mile-an-hour speeds.

By the suddenness and noise of their take-off, they often startle the hunter and leave him waving the muzzle of his gun in hapless confusion. It is the bobwhite's last resort. Even he, the king of upland game birds, cannot outfly modern high-powered lead poisoning.

Science News Letter, October 28, 1950

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METEOROLOGY

Warm Weather Continues Over Most of Country

➤ THIS will continue to be an unusual fall. The extended forecast section of the Weather Bureau predicts that most of the country will have above normal temperatures until the middle of November.

The Pacific northwest, the northern Rocky Mountain states and the northern plains, as well as southern Florida, however, will be colder than normal. Southern Texas will have the warmest weather.

There is no prediction for any considerable area of the country of just plain normal temperatures.

Opposite corners of the country will experience above normal rain—and in some cases snow—during the next two weeks. Those are the Pacific northwest and the northern plains, and way across the country in southern Florida. There is a section of the country between those two, extending from the Southwest up through Texas and into the middle Atlantic states in which less than normal rains can be expected. The rest of the country is expected to get along on the usual amounts of rain.

Science News Letter, October 28, 1950

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CHEMICAL KINETICS—Keith J. Laidler—*McGraw-Hill*, 408 p., illus., \$5.50. A general text for advanced courses.

CHEMISTRY: Visualized and Applied—Armand Joseph Courchaine—*Putnam*, 687 p., illus., \$5.50. An introductory college text.

COMPETITIVE POSITION OF CHICKEN AND EGG PRODUCTION IN THE UNITED STATES—Raymond P. Christensen and Ronald L. Mighell—*Gov't. Printing Office*, U. S. Dept. of Ag. Tech. Bull. No. 1018, 58 p., illus., paper, 20 cents.

EXPERIMENTING WITH NUMBERS: Teacher's Manual for Use with Beginners—Catherine Stern—*Houghton Mifflin*, 105 p., illus., paper, 60 cents. Many number games for beginners are presented.

EYES AND INDUSTRY (Formerly Industrial Ophthalmology)—Hedwig S. Kuhn—*Mosby*, 2nd ed., 378 p., illus., \$8.50. The author includes much of the latest information from the literature in this field.

FIELD BOOK OF SEASHORE LIFE—Roy Waldo Miner—*Putnam*, 888 p., illus., \$6.00. A manual of the more common invertebrate animals inhabiting the shallow oceanic waters of the Atlantic Coast. Many color plates and black and white illustrations.

THE GUIDANCE PROGRAM IN THE PUBLIC SECONDARY SCHOOLS IN NEW JERSEY—Rex B. Cunliffe—*Rutgers University Press*, 57 p., illus., paper, \$1.00.

HISTORY OF THE WOMAN'S MEDICAL COLLEGE, PHILADELPHIA, PENNSYLVANIA 1850-1950—Guhelma Fell Alsop—*Lippincott*, 256 p., illus., \$4.00.

INHERITANCE IN DOGS: With Special Reference to Hunting Breeds—Oyvind Winge—*Comstock*, 153 p., illus., \$3.50. The author discusses general and specific hereditary characteristics of dogs. Translated from the Danish by Catherine Roberts.

INVENTORIES OF APPARATUS AND MATERIALS FOR TEACHING SCIENCE, Vol. I: Primary, Secondary and Vocational Schools—UNESCO, UNESCO Publ. No. 560, 92 p., \$1.00. A reference manual for selecting essential equipment.

JACOB STEINER'S GEOMETRICAL CONSTRUCTIONS WITH A RULER: Given a Fixed Circle with Its Center—Raymond Clare Archibald, Ed.—Scripta Mathematica, 88 p., illus., \$2.00.

Translated from the first German edition by Marion Elizabeth Stark

KEYS TO WOODY PLANTS—W. C. Muenscher—*Comstock*, 6th ed., 108 p., illus., \$1.25. A guide to woody plants in the summer or winter condition. For students of systematic botany and interested laymen.

LABORATORY MANUAL FOR GENERAL BOTANY—Wilson N. Stewart, Harry J. Fuller and Oswald Tippo—*Holt*, 62 p., illus., paper, \$1.25. To accompany **COLLEGE BOTANY** by Fuller and Tippo.

LIFE'S PICTURE HISTORY OF WORLD WAR II—Arthur B. Tourtellot, Ed.—*Time, Inc.* (Trade Distributors: Simon & Schuster), 368 p., illus., \$10.00 (Deluxe Edition: \$12.00). A collection of photographs portraying the history of World War II. John Dos Passos did the full page texts.

MEDICAL ENTOMOLOGY—Robert Matheson—*Comstock*, 2nd ed., 612 p., illus., \$7.50. A college text brought up-to-date.

MEDICAL ENTOMOLOGY: With Special Reference to the Health and Well-being of Man and Animals—William B. Herms—*Macmillan*, 4th ed., illus., \$9.00. Based on the book known as **MEDICAL AND VETERINARY ENTOMOLOGY**, this new edition is brought up to date.

MICROBIOLOGY WITH APPLICATIONS TO NURSING—Catherine Jones Witton—*McGraw-Hill*, 692 p., illus., \$4.50. A text for student nurses.

MYCOTROPHY IN PLANTS: Lectures on the Biology of Mycorrhizae and Related Structures—Arthur P. Kelley—*Chronica Botanica*, 223 p., illus., \$4.50. A study of the chief biological aspects of plants nourished by this fungus.

OUR FOREIGN POLICY—Department of State—*Gov't. Printing Office*, Dept. of State Publication 3972, 99 p., illus., paper, 30 cents. A report of our present foreign policies and a brief discussion of the atom problem.

PHYSICAL EXAMINATION IN HEALTH AND DISEASE—Rudolph H. Kampmeier—*F. A. Davis*, 821 p., illus., \$8.00. A textbook on physical diagnosis.

PLANTS OF BIKINI AND OTHER NORTHERN MARSHALL ISLANDS—William Randolph Taylor—*University of Michigan Press*, 227 p., illus., \$5.50. Report on the flora of these islands before the detonation of the atomic bomb.

THE PRIMEVAL ATOM: An Essay on Cosmogony—Georges Lemaître—*Van Nostrand*, 186 p., \$3.00. A treatise on the theoretical science translated from French by Betty H. and Serge A. Korff. Canon Lemaître is the Belgian astronomer famous for his expanding universe theory.

THE PRIVATE LIFE OF THE PROTOZOA: And of Their Neighbors The Metazoa and The Insect Larvae—Winifred Duncan—*Ronald*, 141 p., illus., \$3.00. Glances at the life cycles of the protozoa, flatworms, snails and other metazoa and of the insect larvae. For the beginning biology student and the layman-naturalist.

PROCEDURES FOR HOME FREEZING OF VEGETABLES, FRUITS, AND PREPARED FOODS Classified Notes on Review of Literature—Elsie H. Dawson, Gladys L. Gilpin and Howard Reynolds—*Gov't. Printing Office*, U. S. Dept. of Ag. Handbook No. 2, 106 p., paper, 40 cents.

RADIO, TELEVISION AND SOCIETY—Charles A. Siepmann—*Oxford University Press*, 410 p., \$4.75. Reviews the history of broadcasting in the United States, surveys its effects on the outlook and behavior of listeners and describes the systems under which it operates here and abroad.

RECENT ADVANCES IN OCULAR PROSITHESIS—J. H. Prince—*Williams and Wilkins*, 155 p., illus., \$4.00. The author discusses the surgical and fitting technique of plastic artificial eyes.

SEROLOGY WITH LIPID ANTIGEN. With Special Reference to Kahn and Universal Reactions—Reuben L. Kahn—*Williams and Wilkins*, 327 p., \$6.00. An advanced college text.

SEX IN PSYCHOANALYSIS—Sándor Ferenczi—*Basic*, 338 p., \$3.50. A collection of some of the author's papers written between the years of 1908 and 1914 and translated from the Hungarian by Ernest Jones. The introduction is written by Clara Thompson. This book has been long out of print.

SOVIET STRENGTH AND STRAIGHT IN ASIA—Ivar Spector—*Superior*, 52 p., illus., paper, \$1.50. A sample coverage of what the Soviet Government has to say through the Soviet press about world issues.

STATIC AND DYNAMIC ELECTRICITY—William R. Smythe—*McGraw-Hill*, 2nd ed., 616 p., illus., \$8.50. A college text brought up-to-date.

THE TEMPORAL REGION OF THE PIRMIAN REPTILE DIALECTS—Everett Claire Olson—*Chicago Natural History Museum*, 15 p., illus., paper, 20 cents. A brief study of the temporal region of the skull of this ancient reptilian animal.

TRANSACTIONS OF THE WISCONSIN ACADEMY OF SCIENCES, ARTS AND LETTERS, Vol. XL, Part I—Wisconsin Academy of Sciences, Arts, and Letters, 267 p., illus., paper, \$2.00.

TURKLY FOOT RIDGE SITE. A Mogollon Village, Pine Lawn Valley, Western New Mexico—Paul S. Martin and John B. Rinaldo—*Chicago Natural History Museum*, 159 p., illus., paper, \$2.75. An archaeological investigation.

UNDERSTANDING NATURAL CHILD BIRTH: A Book For the Expectant Mother—Herbert Thomas and Laurence G. Roth—*McGraw-Hill*, 112 p., illus., \$3.50. Many questions of the expectant mother are answered. A picture story is presented by David Linton.

VETERINARY BACTERIOLOGY AND VIROLOGY—Ival Arthur Merchant—*Iowa State College Press*, 4th ed., 885 p., illus., \$7.25. A textbook for students of veterinary medicine.

WINES OF THE WORLD—Peter Valaer—*Abelard Press*, 576 p., \$6.50. The story of wine from the appearance of the first seedling to the popping of the cork of the well-aged bottle.

ZOO SCHOOL—Mark Mooney, Jr.—*The Camera, Inc.* (U. S. Distributor: Greenberg), 62 p., illus., paper, \$1.00. Animal pictures, rhymes and sketches for children.

ew Machines and Gadgets

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., Washington 6, D. C. and ask for Gadget Bulletin 542. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

⚙️ **BLINKING GEIGER COUNTER**, developed for use of amateur and professional prospectors for uranium and other radioactive ore, has a flashing neon light to indicate the radioactive counts. The instrument is sensitive to both beta and gamma radiation.

Science News Letter, October 28, 1950

⚙️ **ILLUMINATED ANTENNA** for automobiles, recently patented, has a small electric bulb at the top which is energized from the car's storage battery. The electrical connections are such that they do not interfere with the radio-reception function of the antenna.

Science News Letter, October 28, 1950

⚙️ **FISHERMAN'S FLY-BIN** holds up to 70 hooks and flies in a pocket-size plastic casing in five compartments, each a section of a solid permanent magnet. Hooks and flies are held firmly, separately and vertically by the magnetic grip. They are visible through a transparent cover made of plastic.

Science News Letter, October 28, 1950

⚙️ **MIRROR BLANKS**, for large mirrors to take a small picture from the face of the television tube and enlarge it to fill a motion picture theater screen, are now being produced by production-line methods.



The 26-inch blank in the picture is contrasted with a 6-inch reflector.

Science News Letter, October 28, 1950

⚙️ **SLINGSHOT** to shoot an arrow is much like the forked-stick affair long used by boys but is molded of plastic and has

a wire between the upper ends of the arms. The notch of the arrow fits a cord connecting the rubber "power strands" while its shaft lies on the wire.

Science News Letter, October 28, 1950

⚙️ **LUBRICANT**, made from the extremely "greasy" metal molybdenum, comes in liquid form having the appearance of oil but containing no oil whatever. After application to bearing-surfaces, the liquid carrier evaporates, leaving the molybdenum to provide a dry but excellently lubricated bearing.

Science News Letter, October 28, 1950

⚙️ **NON-FREEZING FAUCET**, to deliver water from a building to an outside hose, has a shank that extends through the building wall with the valve in a protected position at the inner end. The handle, on the outside, can be easily removed from its stem, thus preventing unauthorized use of the faucet.

Science News Letter, October 28, 1950

⚙️ **ANTI-STATIC LIQUID**, to treat all kinds of plastic phonograph records, will keep them dust-free and eliminate cracking noise and static electricity. It may be used on television magnifier lenses to stop static-caused dust attraction.

Science News Letter, October 28, 1950

Do You

There are nearly 14,000 rubber plantations in India.

Some birds use saliva as cement in making mud nests.

The southern extremity of Norway is farther north than the northern tip of Newfoundland.

Trained observers can identify from airplanes forest oaks infested with oak wilt, the damaging disease usually shows up first in discolored branches near the top.

Over 80% of the heat required to keep comfortable an experimental solar house built by the Massachusetts Institute of Technology was obtained directly from the sun during the past two winters.

Little Smokey, the black bear on fire-prevention posters, actually knows the meaning of forest fire, before coming to the National Zoo in Washington, he was burned by a forest fire in New Mexico.

EXPERIMENTAL KITS

Oil
Shale

Stainless
Steel

Iron
Ore

ALL
FOR

OIL SHALE—The source of the fuel of the future . . . 5 specimens of the material now in the limelight as a potential fuel supply to supplement our domestic oil resources.

STAINLESS STEEL—6 specimens show some of the reasons why stainless steel is known as the "jewel" of the steel industry.

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I enclose \$1 for which please send me the Oil Shale, Stainless Steel, and Iron Ore kits. My address is imprinted at the right.

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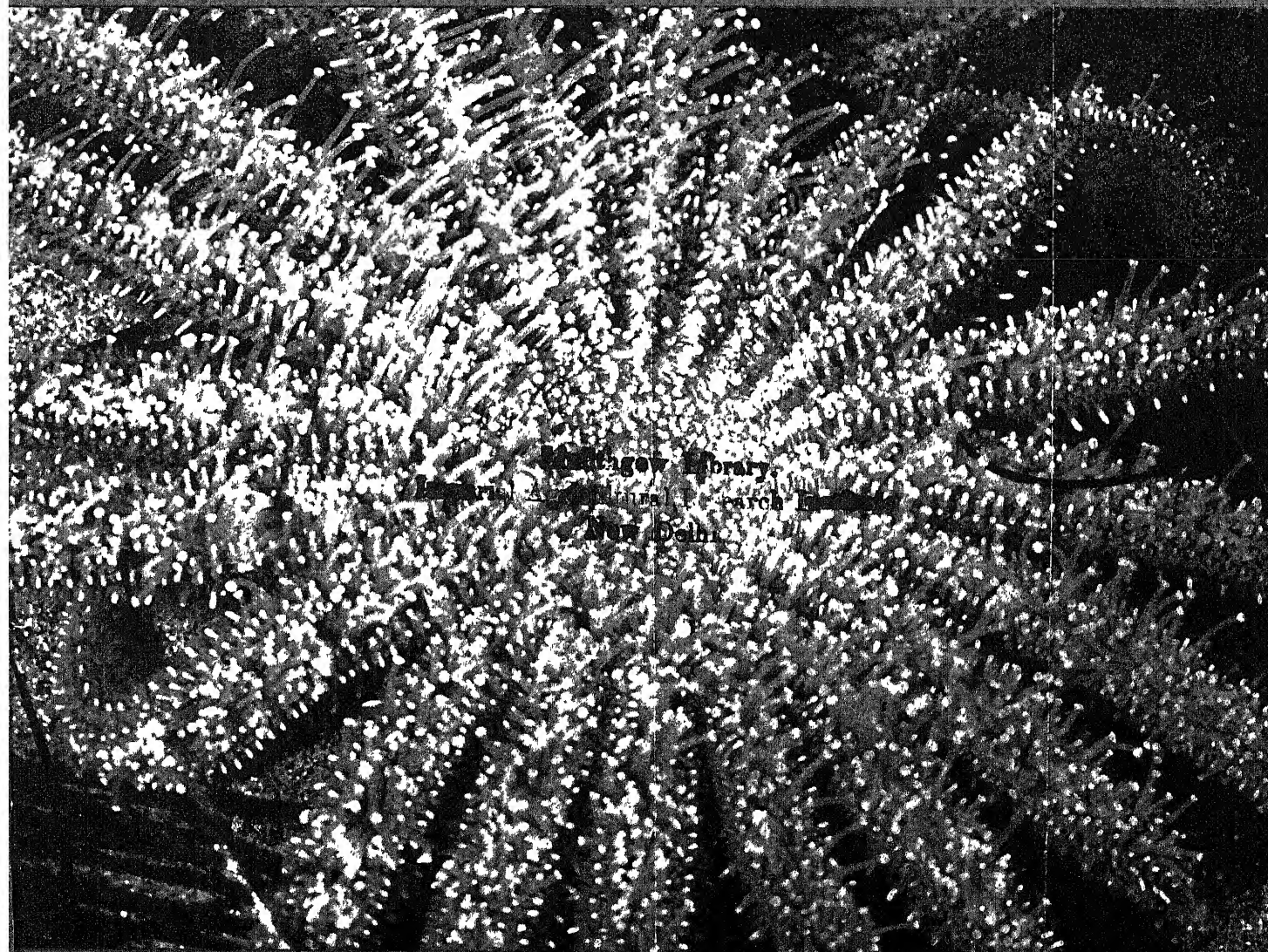
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November 4, 1950

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Starfish Feet

See Page 302

A SCIENCE SERVICE PUBLICATION

\$5.30 A YEAR

VOL. 58 NO. 19 PAGES 289-304

GENETICS-NUCLEAR PHYSICS

No New Types of Freaks

Rays from atomic bombs would not cause any more grotesque types of human being than those now known, but mutations would simply occur more often.

➤ ATOMIC warfare would not give rise to new and fearsome races of human monsters in future generations

That was the opinion of a panel of atomic and genetic experts who met in London to discuss "The Biological Hazards of Atomic Energy."

According to such authorities as Dr. D. G. Catcheside, Cambridge University geneticist, the mutation types produced by exposing reproductive cells to the kinds of rays given off in an atomic explosion are no different from those which spring up quite spontaneously. The only effect of irradiation is to speed up the mutation rate so that the odd types appear more frequently.

Referring specifically to atomic bombs, Dr. Catcheside said: "Geneticists would not expect any more bizarre types following irradiation (as at Nagasaki and Hiroshima) than would turn up naturally"

Nonetheless the experts urged that extreme precautions be taken to protect people of reproductive age and younger from unnecessary exposure to penetrating rays, including X-rays. All such rays cause damage to the genes, which carry hereditary characteristics from generation to generation. It is conservatively estimated that over 99% of mutated genes are harmful.

In most cases the hereditary changes which take place are recessive in character, that is, they must be inherited from both

parents to show up as a positive defect. The results of present carelessness in exposure, therefore, may not show up for many generations, but ultimately they will result in human misery and wastage.

Prof. K. Mather of Birmingham University put it like this. "If you murder a gene, sooner or later murder will out!"

The principal harmful genetic effects of excessive irradiation were listed as: an increase in stillbirths and miscarriages, an increase in inherited deformities and an increase in the incidence of familial disease. All of these would show up in future generations

According to studies made at the British Atomic Energy Research Establishment at Harwell it is not the person working on atomic piles that is in special danger of excessive irradiation. Precautions taken to protect such workers from stray atomic rays have proven effective. For the most part the exposure of such workers is kept well within the agreed safe levels.

Much more danger exists in the indiscriminate use of X-rays in mass chest radiography for tuberculosis and in such lay devices as the X-ray machines used in shoe stores so that you can see how your shoes fit. Though the immediate danger to the person so exposed is slight, the cumulative effect over a whole population may well cause serious increases in harmful mutations in future generations.

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suspected cases of cancer in any part of the body.

Using a cytological, or cell smear test, unsuspected cancer of the womb has been detected on the average in one out of every 100 women examined during the past two years in a screening program carried on by the National Cancer Institute at the U S Public Health Service dispensary in Washington.

These results were reported by Dr. E. D. Murphy. Diagnosis of cancer of the womb and more knowledge of the controversial pre-cancerous conditions of the womb may come from Dr. Murphy's success, just announced, in producing cancer of the womb, or uterus, in mice

These cancers are very much like human cancers and shed cells much as human cancers do. The cells that have been shed form the basis of the cell smear diagnostic test for cancers of the uterus and other organs, such as lungs and stomach, which was originally devised by Dr. G. N. Papanicolaou of Cornell University Medical College, New York

Science News Letter, November 4, 1950

ARCHAEOLOGY

Greek Language Riddle One Step Nearer Solution

➤ THE RIDDLE of an unreadable language that was used by the Greeks over 3,000 years ago is one step nearer solution.

Dr. Carl W. Blegen of the University of Cincinnati reported in Philadelphia that he and Dr. Emmett L. Bennett of Yale University have sorted out 1,300 words of this unreadable language. From these words they have arranged an alphabet of 74 characters as well as 50 other signs.

"We don't know how it sounds or what it means, but 1,300 words are more than basic in whatever the language is," Dr. Blegen told the members of the American Philosophical Society meeting. "All that is needed to begin a dictionary in a language is 800 words"

Drs. Blegen and Bennett compiled the words and alphabet when they were preparing for publication a book to contain reproductions of hundreds of clay tablets on which the language is written. This book will give language experts a chance to study the clay tablets, all of which are bookkeeping records.

The clay tablets were discovered by Dr. Blegen in the archives room of the palace of King Nestor, who lived more than 3,000 years ago in Greece. These hundreds of tablets were the first to be found on the mainland of Greece, although the same language had been found on the Island of Crete 50 years ago.

When discovered, the tablets were soft. They had to be dried and hardened, cleaned and photographed. During the war they were stored in an underground vault in Greece. Last summer they were brought back to the United States for study.

Science News Letter, November 4, 1950

MEDICINE

Yardstick for Cancer Test

A cancer detection test, to be used as X-rays are in spotting TB, would have to detect 90% of the cases and show no more than 5% false positive results.

➤ A YARDSTICK for judging a cancer detection test has been set up by the National Cancer Institute. A test that measures up to this yardstick will: 1. detect 90% of the actual cases of cancer and 2. show no more than 5% false positive results.

This yardstick was described by Dr. John E. Dunn at the conference of State and Territorial Health Officers in Washington.

So far, he said, no test suitable for detecting cancer in the healthy population, as X-rays are used to screen tuberculosis patients, has yet measured up entirely to the yardstick.

This does not rule out some of those now under investigation, however. Some of them have not measured up because they have not been tried on enough healthy people in the cancer age group.

A blood flocculation test reported last spring by Dr. Harry S. Penn of the University of California at Los Angeles needs to be tried by other scientists to see whether it can get as good results with it as its originator.

The yardstick Dr. Dunn described is for tests that can be given easily and cheaply to large numbers of persons to pick up un-

NUTRITION

Go Deep for Food

An unexplored layer in the ocean may be the source of undreamed of quantities of food. Sawdust and ocean fish farms will be sources of food for the hungry.

► PILES of sawdust, "fish farms," or unknown creatures which live in a mysterious, echo-bouncing layer in the ocean's depths, all may some day help to feed a hungry world.

Great masses of tiny green algae could be cultivated as a new form of fresh water food. New hybrid plant varieties could greatly boost the vital output of farmers everywhere, from America's corn and wheat belt to Chinese rice paddies or tropical sugar cane plantations.

These are all serious possibilities for increasing the world's future food supply, four scientists reported to the American Philosophical Society in Philadelphia, Pa.

Pilot plants are already in operation converting material with little or no food value—sawmill residue, the evil-smelling wastes from wood-pulp mills and cast-off parts of agricultural crops—into digestible sugars, proteins and fats, Dr. Alfred J. Stamm, research chemist of the U. S. Forest Products Laboratory at Madison, Wis., said.

Next to soybean meal, yeast foods made from wood sugar molasses appear to be the cheapest source of proteins in the world, he said. Proteins are among the major foundation stones of human and animal nutrition.

From a ton of wood waste, a ton of sugar-rich molasses can be produced by a Forest Service process developed during World War II, Dr. Stamm reported. This molasses is palatable to cattle but not to humans. However, the bitterness (much like blackstrap molasses) can be removed by filters or by crystallizing out pure dextrose sugar.

From wood molasses, Dr. Stamm said, a protein livestock feed high in vitamins can be produced by growing yeasts and molds on the sugar. These yeasts compare favorably in food value with baker's and brewer's yeasts.

Dr. H. A. Spoehr, emeritus chairman of the division of plant biology of the Carnegie Institution of Washington and consultant to the Secretary of State, told of current experiments in growing a form of fresh water algae, the chlorellas, as another source of proteins and fats.

Dr. Merle T. Jenkins, plant scientist for the U. S. Department of Agriculture, said tremendous gains have already been achieved in the yields of farm crops by introduction of hybrid strains.

Examples he cited: Wheat output has gone up 20% in 25 years in South Dakota; hybrid corn has boosted acre yields by at least 25%; Japanese rice production has

gone up 70% in the past 65 years; Maine is growing 75% more potatoes per acre than 20 years ago; hybrid strains have doubled the yield of sugar cane in Java in 30 years.

It is fish and other foods from the oceans, however, which may ultimately have to feed expanding populations in areas of the world where there is not enough to eat, Dr. L. A. Walford, chief of fishery biology in the U. S. Fish and Wildlife Service, wrote in a paper which was read in his absence.

In the immediate future, he said, cultivation of fish like farm crops, growing them in artificial ponds, in rice paddies, in man-

made lakes back of dams or in irrigation ditches "can be a most fruitful way of improving the supply of protein foods."

But in the ocean, Dr. Walford reported, "there is an unknown thing, still unexplored, still unexplored, which may prove to be an extravagantly large food resource." This is what scientists now call the "deep scattering layer."

During World War II, echo sounding instruments discovered a layer of "something" between the surface and the bottom, everywhere in the ocean. Sometimes there was more than one such layer. Scientists who have studied the phenomenon, Dr. Walford said, agree that it is caused by masses of living organisms. But because nets do not exist which can be used at the great depths where the layer occurs, what these organisms are remains unknown.

"The least result to be expected from research into the deep scattering layer would be the extension of human knowledge about the earth," Dr. Walford wrote. "The most practical result might be undreamed-of quantities of food."

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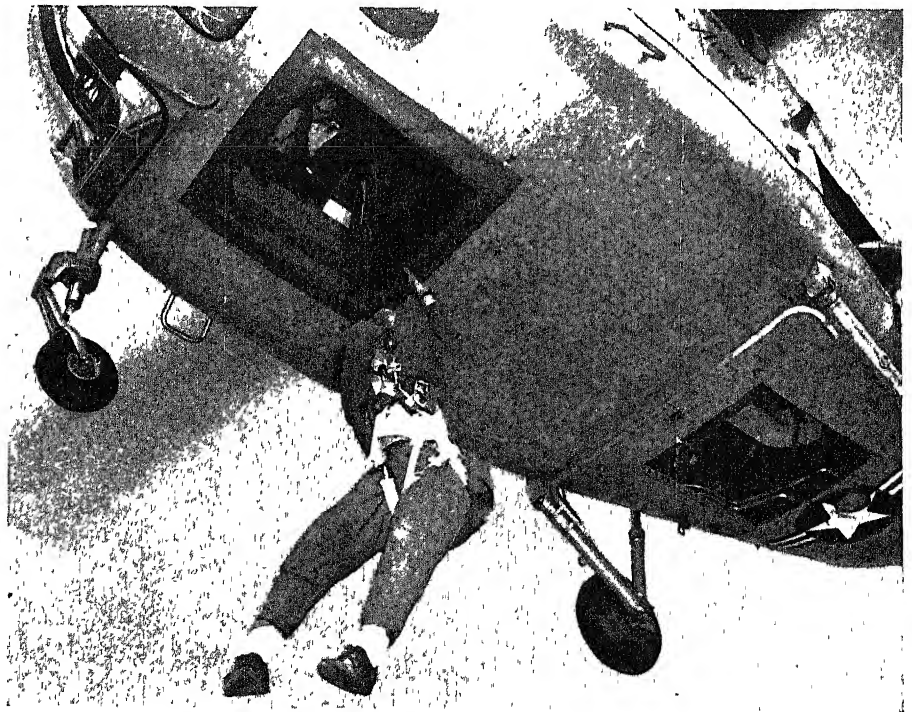
AGRICULTURE

Natural Rubber Reserve

► JUST as in the first days of World War II, the Government is again showing interest in a scraggly desert plant called guayule. The reason: Guayule produces rubber—natural rubber—and it can be grown in the United States.

Scientists of the Department of Agriculture have announced they have succeeded in breeding new hybrid strains of the plant which yield 25% to 40% more rubber than the World War II variety.

Work on guayule has been going on at



UP THROUGH THE HATCH—The Air Force H-12, new multi-purpose helicopter, effects a rescue from a life raft. The man is brought directly into the cabin of the helicopter by an inside hoist.

Salinas, Calif., since 1942—the year the Japanese cut the U. S. off from the natural rubber plantations of the Far East. Then, a few weeks after Pearl Harbor, Congress authorized 32,000 acres of guayule planting in California as an emergency source of rubber.

Not much rubber was obtained. It took until 1944 for the first plants to be harvested and the cost per pound of guayule rubber was very high. Synthetic rubber was developed meanwhile to meet America's need.

But the research on guayule continued. The Agriculture Department believes the plant may some day be grown profitably on some 2,000,000 acres of dust-dry land in Texas.

Test plantings have been carried out with the aid of the Texas Agricultural Experiment Station. Other plantings have been made in California on Government-owned range land.

One of the new hybrids developed by the scientists is reported to breed true from seed and to carry first-generation vigor into succeeding generations. It is believed that seedlings of the productive new strains will produce about 1,200 pounds of rubber per acre in five years of growth.

Guayule will probably never supply all the natural rubber this country needs. But with the tropical rubber belt of Indonesia and Malays under increasing Communist pressure, the U. S. is once again eyeing this desert shrub as a possible "living reserve" of rubber here at home.

Science News Letter, November 4, 1950

GENERAL SCIENCE

UNESCO Gift Stamps Help Teach Science Overseas

➤ YOUR quarter can help send film equipment or medical and scientific books to institutions in countries that cannot now buy these and other needed educational

materials because of their dollar shortages.

A plan by which school children, youth groups, adult organizations and all others can contribute to reconstruction overseas is being discussed in Washington. Known as the UNESCO Gift Stamp program, small contributors would buy stamps toward the purchase of \$10 gift coupons. These gift coupons are now being used to buy books, films and other educational, scientific and cultural supplies for countries overseas.

The United Nations Commission for UNESCO states in Washington that the Gift Stamps are expected to be available after the first of the year.

Specific projects for which the money may be used include equipping school laboratories, buying movie projectors for mass education campaigns, sending medical and scientific books to schools and professional societies and training programs for technical personnel in underdeveloped countries.

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ZOOLOGY

Losses Cut 75% with Rat Control Measures

➤ WITH warfarin, a new rat-killing poison, and with other new anti-rodent "ammunition," the U. S. Fish and Wildlife Service believes the nation's annual loss to rats and mice can be cut by at least 75%.

On one dairy farm alone, warfarin killed 1,400 rats in two months, Walter W. Dykstra, rodent control official of the Fish and Wildlife Service, told the National Pest Control Association in Cincinnati.

Warfarin is a slow-acting poison which causes internal hemorrhages in housemice or rats, even if only a very small amount of it is consumed. And animals do not know they've been poisoned after eating warfarin bait; they keep coming back for more until they die.

Other tricks to keep away rodents and bird pests: Stinging charged wires along building ledges and over doorways to create an electrical field which will shock pigeons or starlings. And sending out high-frequency sound waves, above the audio limit of the human ear, to scare away both birds and rats and mice. This method, said Mr. Dykstra, has even caused rats to jump overboard from ships.

Science News Letter, November 4, 1950

SCIENCE NEWS LETTER

VOL. 58 NOVEMBER 4, 1950 No. 19

42,900 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W., Washington 6, D. C., North 2255. Edited by WATSON DAVIS.

Subscription rates 1 yr., \$5.50, 2 yrs., \$10.00, 3 yrs., \$14.50, single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to periodical literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STAtE 4439.

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Question Box

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How do gift stamps help to teach science? p. 292.

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What do the six new strains of influenza have in common? p. 295.

What infections does a digestive enzyme now fight? p. 296.

What kind of banks beside blood banks may soon become popular? p. 296.

What organ of the body can stand in for a missing stomach? p. 293.

Photographs: Cover, Woody Williams; p. 291, Bell Aircraft; p. 293, Reichstein photo from World Wide Photos; p. 294, General Electric; p. 295, Yale University News Bureau; p. 298, American Red Cross; p. 304, RCA Victor.

MEDICINE

Nobelists Found Cortisone

Dr. Kendall, Dr. Hench and Dr. Reichstein are awarded the Nobel prize for the discovery of the gland chemical which has found many uses.

➤ MILLIONS of sufferers from arthritis, now and in the future, will join in the world's thanks to the three latest Nobelists in medicine, Drs. Edward C. Kendall and Philip S. Hench of the Mayo Clinic and Dr. Tadeus Reichstein of the University of Basle, Switzerland.

But the arthritis sufferers, rejoicing over relief of painful, stiff and crippled joints, are not the only ones to benefit from the chemical remedy discovered by these three men.

Little children bed-ridden with heart-crippling rheumatic fever, patients with severe eye inflammations, asthmatics and other allergy sufferers, victims of severe burns and perhaps, in future, even patients with cancerous diseases of blood and lymph glands may be helped from the discovery of a gland chemical now called cortisone.

The chemical is produced by the outer part of two small glands, the adrenals, that are located just above the kidneys. Dr. Reichstein, organic chemist who synthesized the anti-scurvy vitamin C almost two decades ago, and Dr. Kendall, biochemist, both spent more than 10 years in their laboratories half a world apart extracting and identifying the various chemicals produced by these two small glands. Then, independently but at about the same time, they announced the discovery of cortisone.

Meanwhile Dr. Hench for about the

same two decades had been searching for a chemical that would help the arthritis sufferers he saw daily at the Mayo Clinic. He observed that attacks of jaundice, pregnancy, periods of fasting, surgical operations and anesthesia without operation, each

MEDICINE

Stand-In for Lost Stomach

➤ A WAY to give a patient a new stomach when his has been removed because of cancer was reported by Dr. C. Marshall Lee, Jr., of the University of Cincinnati College of Medicine at the American College of Surgeons meeting in Boston, Mass.

Dr. Lee would substitute for the stomach that part of the large intestine which runs up the right side of the abdomen from the appendix region. This is called the right colon, or ascending colon.

By cutting free this and the end four inches of small intestine and rotating it counter-clockwise, it can be brought up into the stomach location. The piece of small intestine is the right size for attachment to the esophagus, or gullet, down which food is swallowed into the stomach.

With this operation, Dr. Lee thinks, the patient would have a kind of stomach which could act as a reservoir for food, even

would temporarily relieve the patients of their pain and cause the joint swellings to go down. From all this, he suspected that the answer to the arthritis problem lay in the adrenal glands. When Dr. Kendall, whose work had been supported by the Research Corporation, New York City, was able to supply him with the first small amount synthesized from a bile acid, he got dramatic proof in the arthritis patients who could walk free from pain after a few doses of the gland chemical.

Now cortisone is available to physicians generally for treatment of patients at a cost to the physician of \$35 for about one-thirtieth of an ounce.

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if it did not do much digesting. The patient would then be able to eat full meals and not get undernourished as sometimes happens now when the entire stomach is removed.

The new colon-stomach would be able to absorb water and send the food along into the intestines. Hydrochloric acid could be given to make up for the lack due to absence of a real stomach. At the age when stomach cancer usually develops, however, stomach acid is normally low anyway, Dr. Lee points out. Liver extract or other remedy could be given for any anemia that might develop.

The right colon is usually not involved even when a cancer in the stomach has grown to large size, so it would be a healthy organ for use as a stomach substitute.

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NOBELISTS IN MEDICINE—Dr. Tadeus Reichstein, professor of chemistry at the University of Basle, Switzerland, and two American doctors, Dr. Philip S. Hench and Dr. Edward C. Kendall of the Mayo Clinic, have been named as joint winners of the 1950 Nobel prize in medicine. The prize came for their work in the discovery of cortisone which has spelled relief for millions suffering from various diseases.

MEDICINE

Lift Veil on Rectal Cancer

A frank approach to the problem confronting 40,000 persons attacked by cancer of the rectum this year is urged in the hope of saving these lives.

► THE AMERICAN people and their doctors, the general practitioners of the nation, are once more urged to "lift the veil of prudery," that thousands of lives may be saved.

The appeal to save lives by approaching frankly a health problem was made by Dr. Austin V. Deibert of the National Cancer Institute, U. S. Public Health Service.

Of the estimated 101,000 new cases of cancer of the digestive tract that will develop in 1950, more than 40,000 will be located in the last eight inches of the lower bowel, Dr. Deibert told members of the American College of Surgeons meeting in Boston.

About three-fourths of these, at least 30,000 patients, can be cured if diagnosis is made early, he stated.

While cancers of the stomach and small intestine are difficult to diagnose because they cannot be felt and cannot be seen without elaborate, often uncomfortable procedures, a large proportion of digestive tract cancers may be regarded as "accessible site" cancers.

"More than two out of every five cancers in the digestive tract are within reach of the physician's finger or proctoscope," Dr. Deibert stated.

The proctoscope is an instrument for inspecting the rectum.

The whole subject, he said, "is so be-

clouded by false modesty that it is difficult to discuss in plain terms.

"Through intensive effort, we have lifted the veil of prudery from syphilis tests and self-examination of the breasts. We must win the right to be equally frank about rectal cancer.

"A simple examination can disclose early rectal cancer and thereby prevent unnecessary death."

Newspapers and magazines, he said, can perform a service by presenting the facts about this cancer to the public.

"We will take our greatest step toward controlling lower bowel cancer when not only physicians but the people recognize it as a controllable disease," he stated.

One of the biggest obstacles to the control of digestive tract cancers at all locations, Dr. Deibert said, is the "pessimistic attitude of the physicians themselves."

As long as this attitude prevails, the average case that comes to the surgeon will continue to be the advanced case with little hope of cure.

In an effort to overcome this attitude and promote earlier diagnosis of digestive tract cancer, the National Cancer Institute and the American Cancer Society have jointly produced a training film for physicians which was previewed at the American College of Surgeons meeting.

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MEDICINE

► SOME 38,000 Americans will develop stomach cancer this year, Dr. J. R. Heller, Jr., director of the National Cancer Institute, declared in Chicago.

Only one out of every five of this year's stomach cancer victims will have their cancers diagnosed early enough for them to have a good chance of survival. The reason is that stomach cancer is "notorious" for not showing any symptoms in its early, curable stages.

Right now many of the 38,000 are apparently perfectly well, going about their business unaware of the danger that threatens them. The same is true to only a slightly less extent of many others who will develop other kinds of cancer this year. Some of these others may be sick and going to their doctors. But their symptoms are vague, or could come from many conditions besides cancer.

A cancer detection test, or several cancer detection and diagnostic tests, are needed to save these lives. One is needed to detect cancer patients among the apparently well. Another is needed to help diagnose cancer in cases where the symptoms and findings are not clear. Separate tests may be needed to diagnose different kinds of cancers and those located in different parts of the body.

In Chicago at the first Conference on Cancer Diagnostic Tests more than a hundred research scientists met to evaluate present cancer tests and to determine what lines of research would produce better ones.

"No test yet reported is completely specific for cancer," Dr. Heller stated at the National Cancer Institute-sponsored meeting.

Perhaps no general cancer diagnostic test will ever be discovered. But National Cancer Institute scientists and many others

throughout the nation are hopeful that some change in the proteins of the blood, or in the enzymes which control many of the body's chemical reactions or in the immune mechanisms of the body will give some clues to better, earlier cancer detection.

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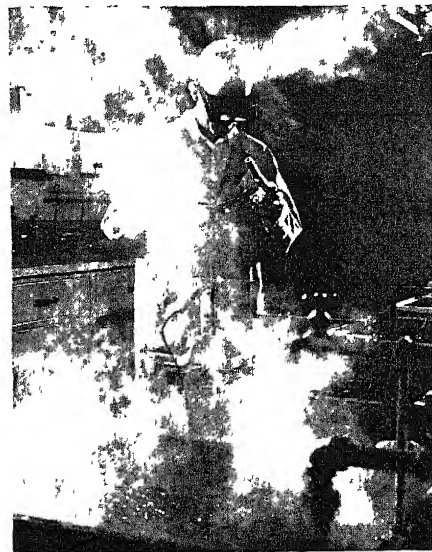
ENGINEERING

Flickering Lights from Welding Machines Near End

► FLICKERING lights caused by electric welding machines can be eliminated through the use of information contained in a bulletin soon to be issued, the American Institute of Electrical Engineers was told in Oklahoma City.

Prof. M. Stanley Helm, Prof. Max A. Fuccett and Marvin Fisher, Jr., of the University of Illinois, explained that they had computed tables showing the size of wires and the amount of current needed to prevent the flicker. Previously power companies have had to guess at these requirements. Electric motor loads as far as five miles away have important bearing on three-phase power lines, they said.

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"UNCHARTED AREAS"—A technician in the Measurements Laboratory of the General Electric Company's Meter and Instrument Divisions recently opened in Lynn, Mass., prepares to plate a part of a measuring device in the inorganic finish laboratory. A special ventilating system changes the air in this area 67 times an hour. The laboratory is dedicated to the "exploration of uncharted areas in the field of electrical measurements".

AERONAUTICS-METEOROLOGY

Airline Delays May Be Cut

A new weather prediction method will eliminate much of the trouble of major airlines caused by poor weather conditions.

➤ "STACKING UP" over airports, switching passenger planes to different fields and cancellations of flights because of weather conditions at the destination will be greatly lessened by a new method of calculating the weather risk now being devised.

U. S. Weather Bureau experts, with the support of the government's Air Navigation Development Board, are developing the method at the Washington National Airport. They believe that airfield controllers will be able to know the percentage of chance of poor ceiling, visibility, and wind and aircraft icing conditions for periods up to six hours in the future. Such forecasts would be used for determining the rate at which aircraft could land and take off and whether, six hours later, it would be advisable to send planes toward a certain airport.

The method is based on findings of J. C. Thompson, formerly at the Weather Bureau's airport station in Los Angeles. Mr. Thompson found that variations in weather conditions at certain localities in California and Arizona had a relationship with whether it was going to rain in Los Angeles. By noting these variations and plotting them on a graph, he was able to predict rain slightly more accurately than by the usual methods and also much more speedily. Within two minutes after receiving data on his variables he would have a forecast.

What is more, Mr. Thompson was able to tell the per cent chance of rain within the 36 hours after he made his forecast.

The problem was to pick six variables out of all the hundreds of variables in weather phenomena. In the Los Angeles experiment, this was a matter of a weatherman's experience. Mr. Thompson plotted on a graph the altitude at which 700 millibars of atmospheric pressure could be found over Oakland against the difference between the sea level pressures in San Francisco and Los Angeles, the wind direction at Sandberg against the temperature at a certain altitude at Santa Maria, Calif., and the sea level pressure at San Francisco against the pressure differences between Los Angeles and Phoenix.

Now Mr. Thompson is working at the Washington National Airport, trying to find a new set of weather variables from which he can predict the percentage of chance in conditions of ceiling, visibility, icing and winds six hours in advance at that airfield. He hopes to have a reasonably good set of variables by next June, but he expects these will constantly be improved upon.

Next step is to work out a general theory

of selecting variables, based on the experience at Los Angeles and Washington. Once that is done, it is the hope that reliable variables could be worked out for every major airport in the nation.

Mr. Thompson believes that the method of numerical forecasting has application wherever man has to take a calculated risk with the weather. An industrialist with equipment open to the rains knows that it will cost, say \$100, to cover it and that his loss if he did not cover it would be \$1,000. If he is told that there is a 10%, 20% or 30% chance of rain, he can calculate whether it is worth while to spend the money protecting his equipment.

Since most military operations are calculated risks, Mr. Thompson believes the numerical method of forecasting could be as well applied on the field of battle.

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ENGINEERING

Underwater Movie Camera Has No Cables to Surface

➤ A NEW underwater motion picture camera for use by diver-photographers differs from earlier models in that it is completely self-contained. Camera and diver require no air supply or electric cable connections to the surface.

It is a development of the U. S. Navy. Details of construction were revealed at a meeting of the Society of Motion Picture and Television Engineers by Chief Photographer's Mate R. R. Conger of the Naval Photographic Center in Washington. It is claimed to be the first completely mobile underwater motion picture camera.

This submarine camera is designed so that it can be completely operated from the outside, with external controls for the lens diaphragm, focus and start-stop switch. It has detachable wings and vertical rudder which aid in transporting and stabilizing the equipment in the water. The camera weighs 107 pounds in air, but can be adjusted to have either positive, negative or neutral buoyancy under water.

Special equipment for the diver using the camera has been developed. Included is an automatic, compressed air, self-contained diving unit. Also there is a face mask and swim webs for the feet. Equipped with these aids, the diver-photographer is able to swim with the camera in any direction or to any depth down to approximately 200 feet.

Uses of the camera range from photographing ship hulls to recording the geological formation of the sea bottom. It can also be used to photograph both marine life and plants.

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MEDICINE

Six New Strains Influenza Found

➤ DISCOVERY of six new strains of influenza virus, all of them found when influenza A-prime was around, was announced in the journal, SCIENCE (Oct. 27).

One of the strains, tentatively called Influenza C, was detected, during a 'flu epidemic last March, by Dr. Thomas Francis, Jr., J. J. Quilligan, Jr., and Miss Elva Minuse of the University of Michigan School of Public Health. This virus, their tests show, has been circulating as far back as 1936. They believe it is the cause of a widespread respiratory disease like 'flu which comes in epidemics.

The other five viruses were discovered by Dr. Thomas G. Ward and Miss Bernice E. Eddy of the Johns Hopkins University, Baltimore, and the National Institutes of Health, Bethesda, Md. These five viruses differ from other influenza viruses in their effect on mice. They will attack mice after growing in only one instead of a series of chick embryos. This may be characteristic for a specific group of viruses, it is suggested, and may be an aid in identifying viruses causing one kind of 'flu from those causing another.

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23-YEAR JOB—Miss Ida Barney, shown at the measuring engine in the Yale observatory, has just completed a measuring job on stars in the sky which lasted for 23 years and required half a million computations. The computations of the measurements fill 13 volumes.

MEDICINE

Digestive Enzyme Fights Infections Caused from TB

➤ A METHOD that offers hope of curing more than half the patients who get empyema from tuberculosis or other infections was reported by Drs. Howard G. Reiser, L. C. Roettig and George E. Curtis of Ohio State University College of Medicine at the meeting in Boston of the American College of Surgeons.

The method makes use of one of the digestive enzymes, trypsin. When a solution of this chemical, marketed under the brand name Tryptar, is used to wash out the chest the thick pus becomes watery thin, and germs and particles of matter disappear within a few days.

In the small series of patients so far treated with the trypsin method, three needed no other treatment and in the others, the chest cavities were sterilized and less radical operations were needed than usual in this condition.

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GENERAL SCIENCE

Women in Homes Get Chance at \$200 Award

➤ WOMEN in their homes will be given, for the first time this year, a chance to win a \$200 award for research work done in their own home.

The award will go to the woman who submits the best paper describing original research carried out within her house. It will be presented at the Cleveland meeting of the American Association for the Advancement of Science in December. Sigma Delta Epsilon, graduate women's scientific fraternity, is granting the award.

Besides this new award, Sigma Delta Epsilon also offers an annual \$1,600 fellowship to graduate women scientists and a \$500 award for outstanding research work by a member of the fraternity.

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MEDICINE

Mass Blood Typing Not Advised for Atomic Defense

➤ DON'T start mass blood typing of the entire population now as preparation for atomic or other large scale disaster.

This, in effect, is the answer given by Dr. Leonard A. Scheele, Surgeon General of the U. S. Public Health Service, to State and Territorial Health Officers meeting in Washington and to communities throughout the nation who have been asking what to do about blood typing.

The only preparedness typing that should be done now is among those persons between the ages of 18 and 60 years who can give blood now for storage and who can

be called on in an emergency as donors.

The need is to find among such persons those donors who have type O blood. That is the so-called universal type which can be given with least risk to any patient regardless of his own blood type.

Dr. Scheele's statement, he said, represents the best thinking of governmental agencies and professional societies on blood typing for civilian defense. Any mass typing at this time, he pointed out, should be undertaken "as a calculated risk and as a test of the method's effectiveness."

Reasons against mass blood typing of the whole population now are 1. the drain on manpower and supplies of typing serum; 2. the danger of errors made by hastily trained personnel, 3. the fact that plasma and such plasma substitutes as salt water drinks, which require no typing, will be used during the immediate emergency period of a large scale disaster.

When the victims reach the hospitals, their blood can be quickly typed and cross-matched with donor blood if the victims need whole blood transfusions.

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DENTISTRY

Drop One High Sugar Diet Item to Prevent Caries

➤ THE ELIMINATION of a single high sugar "habit" item from the diet—such as chewing gum, ice cream, jam or candy—often is sufficient to prevent the formation of cavities in the teeth.

This is reported by Dr. Herman Becks, professor of dental medicine in the University of California College of Dentistry, who recently completed a ten-year study of the relationship between sugar in the diet and dental caries.

The overall study supports earlier reports on the survey which indicate that caries development can be inhibited by reducing sugar consumption. The results are based upon observation of 1542 individuals, about half of whom were observed between 1938 and 1943 and the remainder between 1943 and 1948.

The scientists noted great improvement in caries-prevention in the second group—the result of refinements in technique. In the first group dietary restrictions kept 61% caries-free for a year; in the second group the figure was 81%.

Since so many individuals are unable or unwilling to remain for long on a severe diet, Dr. Becks experimented with the elimination of a single high sugar habit item. In 69.5% of the persons on whom this was tried there was a significant reduction in caries.

Dr. Becks said that while a satisfactory explanation for caries formation has yet to be found, the sugar-caries relationship and the dietary regime continue to form a practical basis for caries prevention.

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MEDICINE

Windpipe Banks May Serve Parts for Replacement

➤ LIVE windpipe banks may be added to nerve, artery and bone banks which doctors of the future can draw on when a patient needs a replacement for that part of his body.

Experiments pointing in that direction were reported to the American College of Surgeons in Boston by two groups of investigators, Drs. Orland Davies, J. Malcolm Edmiston and H. J. McCorkle of the University of California School of Medicine, and Dr. Victor Richards and John E. Connolly of Stanford University School of Medicine.

Heretofore tubes of plastic, metal and fibrous tissue have been used in attempts to replace sections of the windpipe, or trachea, when this had to be removed to eradicate disease.

Pieces of trachea, some fresh and some stored in a trachea bank, have been used successfully as grafts to bridge gaps in dogs' tracheas, both groups of surgical investigators reported.

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MEDICINE

PPLO May Be Cause of Many Mystery Illnesses

➤ SOME of the mystery illnesses of the present may turn out to be cases of infection with PPLO, short for pleuropneumonia-like organisms, it appears from studies reported by Drs. Harry E. Morton and Paul R. Leberman and Mr. Paul Francis Smith of the University of Pennsylvania School of Medicine to a meeting of the Society of American Bacteriologists in Philadelphia.

Until recently PPLO, which are very small disease germs, have been known chiefly as the cause of a contagious pneumonia combined with virulent pleurisy that attacks cattle. In 1937, a team of Harvard scientists found these PPLO in an abscess in a woman patient. Last spring, the Pennsylvania scientists reported evidence for the view that these germs were pretty much confined to the genito-urinary tract in humans and were transmitted like other venereal diseases.

Now the Pennsylvania scientists report that they have found PPLO in saliva, throat cultures and stools of human patients. This indicates that these tiny germs may invade the body by more than one route and may be responsible for infectious illnesses in which the causative germ is at present unknown.

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E FIELDS

MEDICINE

Drug May Cut Deaths In Heart Operations

➤ A LOCAL anesthetic drug, butocaine sulfate, may effect a tremendous saving in lives of patients undergoing heart operations, if experiments reported to the American College of Surgeons in Boston prove successful for human beings.

The experiments were reported by Drs. Alexander H. Bill, Jr., and Jacob C. Wagner of the University of Washington School of Medicine, Seattle.

Operations directly on the heart muscle, the Seattle surgeons pointed out, are apt to result in ventricular fibrillation. This is a dangerous, often fatal condition in which the muscle fibers twitch separately instead of all contracting together for a regular, strong beat. Drugs used to prevent ventricular fibrillation, such as procaine, quinidine and cocaine, have been "unsatisfactory" in the experience of Drs. Bill and Wagner.

Certain characteristics of butocaine sulfate led them to try it in operations on dogs' hearts. They injected a one percent solution of this drug into the sac around the heart five minutes before handling the heart itself. Fibrillation occurred in only two out of 50 cases, or 4%. In another series of 21 similar operations, where other methods of prevention were used, fatal ventricular fibrillation occurred in nine cases, or 43%.

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GENERAL SCIENCE

U. S. Open-Door Policy for Refugee Scientists Lauded

➤ AMERICANS who may have doubted the wisdom of opening our doors to refugee scientists from abroad can be heartened by a tribute from Prof. M. Minkowski, leading neurologist of Switzerland, written after the death of the neuropathologist Otto Marburg who found haven in the United States when he had to flee from Vienna after Hitler's invasion. Bowing to both U. S. and English scientists, Prof. Minkowski writes:

"The Anglo-Saxon colleagues have rendered a very great and highly to be appreciated service to Swiss neurology, as well as to neurological science in general. They did this in giving generous haven in time of need and distress, not only to Marburg, but also to quite a number of distinguished representatives of our science such as Freud, Wallenberg, Goldstein, Spiegel, F. H. Lewy, Riese, Wartenberg,

v. Witzleben and many others. This made it possible for these men to proceed with their fruitful research work which, also under new conditions, has borne a rich harvest and continues to do so."

Echoing emphatically this statement is one from a refugee doctor, Dr. R. Wartenberg, now on the staff of the University of California Hospital and Medical Center, who says:

"All those refugee doctors who enjoy the great American hospitality appreciate this tribute to America, all the more so since it comes from a neutral source."

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ENTOMOLOGY

Desert Locust Invasion Is Nipped in Bud

➤ A DESERT locust invasion now menacing the food supplies of more than 500 million people in Africa and Asia will be stopped where it begins, the breeding grounds.

About the middle of this month, when the winter-breeding season begins, locust-fighting teams spread special poison bait wherever locust breeding grounds are found in Saudi Arabia.

The heaviest rains in 25 years caused this serious threat to the food supplies of the Middle East. Marshall Plan dollars, 179,000 of them, have been marked to aid this fight, the main cost of which will be borne by the British government. Local governments in the affiliated regions will also make contributions to the cost.

The ECA dollars will pay for 57 specially equipped trucks used by the locust-fighting teams.

Since ancient times, locusts have done serious damage to food crops of the world. The last dangerous threat also originated in Saudi Arabia after heavy rains in 1942. That threat was licked by a two-year war waged by the British government.

The present campaign aims at hitting the locusts in their breeding stages for more effective control. Locusts grow wings in about 40 days.

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AGRICULTURE

World Cotton Output 'Cut Eighth by Poor U. S. Crop

➤ THE WORST U. S. cotton crop in years will chop world-wide cotton production by more than an eighth, a statistical report by the Department of Agriculture revealed.

While the rest of the world showed a 2,000,000-bale jump in cotton output, here at home a drop of 6,259,000 bales is predicted. The result will be about 14% less cotton available at a time when economic recovery and speed-up in defense programs is fast increasing the demand for raw cotton.

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ENTOMOLOGY

Last Resort in Killing Flies: Use a Hammer

➤ HOUSEFLIES are becoming so resistant to DDT and other new insecticides that it seems sometimes "it takes a hammer to kill them," a research scientist of the U. S. Department of Agriculture reports.

Not only are flies building up immunity to many different chemical poisons. They are developing new biological habits as well. Dr. Fred C. Bishopp, chief of research for the Bureau of Entomology and Plant Quarantine and an expert on fly control, says.

Where residual sprays are used on the normal roosts of flies in houses or barns—the ceilings, beams and walls—flies now stay away. They spend their time on the floors or in grass or shrubbery outside, he said. The change in habits appears to be passed on to succeeding generations, even though the youngsters have never come in contact with an insecticide.

Dr. Bishopp told National Pest Control Association in Cincinnati recently that the growing immunity of flies to chemical attack is more serious than is generally realized.

It has now been found, he said, that a housefly strain which becomes resistant to one or two specific chemicals may be resistant to all of the commonly used insecticides. Once this high resistance has been developed, he said, it may persist for a long time.

This discovery contradicts the earlier scientific belief that a fly built up immunity only to a specific insecticide or chemical family, Dr. Bishopp said.

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MEDICINE

Terramycin May Save Peritonitis Victims

➤ TERRAMYCIN, one of the new so-called mold remedies, or antibiotics, now shows promise of saving lives threatened by peritonitis, dangerous and sometimes deadly complication of late-treated appendicitis and of other conditions of abdominal infection.

"Promising results" in trial of this drug in both human cases and on laboratory animals were reported by Lieut. Col. E. J. Pulaski, Col. Joseph R. Shaeffer, Capt. Curtis Artz and Major Hinton J. Baker, Brooke General Hospital and Brooke Army Medical Center, Fort Sam Houston, Texas, at the meeting in Boston of the American College of Surgeons.

The drug was first tested against more than 300 strains of microorganisms isolated from operation wounds. In these, it showed potential value as a remedy.

The drug can be given by mouth or by injection into a vein. For the human peritonitis cases it was given by vein.

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SAFETY

Transportation of Injured

Carrying the hurt to safety on improvised stretchers will be necessary if atomic disaster occurs. Be careful that the movement does not cause further injury or sickness.

By JANE STAFFORD

(Last in a series of articles on atomic first aid.)

➤ IF YOU are called on to give first aid in case of an atomic bomb explosion or a highway accident or even a medical emergency in your or your neighbor's home, part of your job may be to get the patient transported to a hospital or a doctor's office.

One of the things you will learn if you take a Red Cross course in first aid is to plan carefully before you start moving the patient. If fire is creeping close or there is danger of walls falling on the victim, you have to move fast. But if you have learned the art of planning for transportation, you will be able to make a plan and carry it out at top speed.

You must always keep in mind that the way you move or transport a patient should be such that it does not cause further injury or sickness. Where broken bones are suspected and you cannot apply splints before moving the patient, try to support or carry the patient in such a way that the broken part is kept as still as possible.

In the great majority of cases you will give first aid and then wait for an ambulance, moving the patient only on a doctor's order and following his directions for how to do it. If you have given first aid, so that bleeding is checked, the patient is breathing regularly and shock has been controlled, there is usually no great rush about doing anything more until the doctor or ambulance does arrive.

Do Not Bother Patient with Plans

When you do your planning, do it without bothering the patient and preferably where he cannot hear your discussion. Don't ask him any more questions than necessary. In planning, figure how the patient is going to be carried to the vehicle, how he is going to be put into it, what materials are needed, and what each helper will do.

For carrying seriously sick or injured persons, a stretcher is best. But putting a patient onto a stretcher and carrying a stretcher are not as easy as you may think. It takes three and preferably four strong people to do it.

If you follow the Red Cross first aid directions you will have one of the bearers put the stretcher close to the injured person, preferably two feet from his head and in a straight line with his body. The pa-

tient lies on his back with feet tied, unless his injuries require some other position

Four Bearers Per Person

Three bearers take positions on one side of the patient, the fourth on the opposite side. If one side is injured, the three should be on the uninjured side. One bearer is at the shoulders, one at the hips and the third at the knees. The fourth is at the hips on the opposite side unless he has a special injured part to care for. All bearers face the injured person and kneel on one knee, the one nearest the patient's feet.

The bearer at the shoulder puts one arm under the patient's head, neck and shoulders and the other under the upper part of the back. The bearer at the knees puts one arm under the knees and the other under the ankles. The third bearer and the man opposite pass their arms under the patient's back and thighs.

The bearers all lift together at a signal and put the patient on the knees of the three men in line. The fourth then puts the stretcher under the patient. The patient

is gently lowered to the stretcher on the signal "Lower."

To carry the stretcher, the bearers stand one at each end and one at each side. The stretcher is raised at a given signal and then at another signal the front and side bearers step off with the left foot and the rear bearer with the right foot. The patient should be carried feet first except up hills, stairs or other steep grades.

Stretchers may be improvised from blankets and poles, or even properly rolled blanket alone, from boards fastened together, or you may use a wide board, door, screen or ladder properly covered with boards or cushions.

If you are going to use a blanket stretcher, first put the blanket beside the patient and tuck—don't roll—two-thirds of the blanket close against the patient's body. Grasping him at hips and shoulders, roll him gently about one-eighth turn away from the blanket. Push the tucked part as far under him as possible, roll him back over the tucked blanket and one-eighth turn further over the blanket. Then pull the blanket on through.

Items for First Aid Kit

As a guide for your first aid kit, you might include these items listed in the American Red Cross First Aid Textbook.

- One-inch compresses on adhesive in individual packages
- Sterile gauze squares—about 3"x3"—in individual packages



MOVING WITH CARE—An improvised stretcher made with two tree branches and a blanket is used in transporting a patient. Three or four persons are needed to move one victim.

Assorted sterile bandage compresses in individual packages
 Triangular bandages
 Sterile gauze in individual packages of about one square yard
 Roll of one-half inch adhesive
 Inelastic tourniquet
 Scissors (blunt tipped are best)
 Three-inch splinter forceps
 Paper cups
 One-inch and two-inch roller bandages
 Wire or thin board splints

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MEDICINE

New Operation Helps Colitis Patient

➤ A NEW operation for ulcerative colitis was reported by Drs. Benjamin G. P. Shafiroff and J. W. Hinton of New York University College of Medicine at the meeting in Boston of the American College of Surgeons.

The operation, termed denervation of the pelvic colon, consists in cutting certain nerves to the colon. "Marked improvement" in both symptoms and physical condition of five patients followed this operation.

Science News Letter, November 4, 1950

PUBLIC HEALTH

Grants for Research

➤ BLOOD, a new vitamin, preserving bones and teeth into old age, curing deafness in school children and a conception-to-death study of growth are among the 155 research problems for which the U.S. Public Health Service has awarded grants totalling \$4,708,766.

The blood research will continue studies already under way under the leadership of Dr. E. J. Cohn and Dr. Charles A. Janeway of Harvard University on methods of separating elements of the blood, preserving them for longer periods and thus making blood more useful than ever, both in case of atomic attack and for saving lives threatened by such peacetime conditions as heart, kidney and joint diseases.

In order to determine whether radium treatment for prevention of deafness due to overgrowth of adenoid-like tissue is effective and cheap enough to be recommended for routine use in regular school health programs, 1,000 Baltimore, Md., school children will be tested under the grant to Dr. Samuel J. Crowe, Johns Hopkins University professor who originated

the method.

The conception-to-death study is under the direction of Dr. Alfred Hamlin Washburn of the Child Research Council, Denver, Colo. Purpose of the study is to correlate physical, mental and emotional factors over a long period in order to develop more reliable methods for determining patterns of normal and healthy growth. Investigation of individual differences in growth of a selected group of persons from the prenatal period to death and through several generations of their descendants is planned. A score of research workers in pediatrics, physiology, biochemistry, hematology, nutrition and psychiatry will continue the investigations already begun on 166 persons.

In another study awarded a research grant, local police, hospitals and physicians will cooperate in furnishing patients for tests as to whether an artificial kidney can prevent death from an overdose of sleeping pills. This one will be conducted by Drs. Harold Jeghers and Theodore Koppány at Georgetown Hospital, Washington, D.C.

Science News Letter, November 4, 1950

ECONOMICS

Food More Costly in '51

➤ THE WORLD'S housewife will go to market in the coming year to buy more food than the farmer can supply.

This is the essence of an 81-page annual report issued by the Food and Agriculture Organization of the United Nations.

The Korean crisis and subsequent quickening of world rearmament, said FAO, will lift purchasing power and the demands by people nearly everywhere for food and other agricultural products.

At the same time, the United Nations agency predicts, supplies of food will be only slightly greater than in the past year, barely keeping pace with increases in world population.

The result, FAO experts believe, will be rising prices and a boom in international trade in agricultural products. Already wool and rubber have been gravely affected, they pointed out, and demands for rice, cotton, coffee and cocoa have begun to outrun available supplies.

The annual FAO study, entitled "World Outlook and State of Food and Agriculture—1950," pointed to the brighter side of the picture. Military expenditures by the U. S., it said, will put more dollars into international trade. Dollar shortages in other parts of the world will be reduced.

"It seems that bitter fighting on a peninsula of Asia and world-wide increases in economically unproductive armaments will do more to improve certain aspects of the international distribution of food than all

the direct efforts made since 1946," wrote the FAO Director-General, Norris E. Dodd. "This is not a flattering commentary on international statesmanship."

In supplies of food per person, said the report, the world will make only a slight

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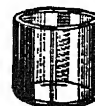
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gain. There may be no improvement in areas which need it most.

Meanwhile, with "a marked increase in dollars available to many countries . . ." said FAO, "the demand for food and agricultural products will tend to run ahead

of supply . . . It is clear that prices will continue to rise."

When she gets to market, the world's housewife will find it costs more to feed her family.

Science News Letter, November 4, 1950

RADIO

No Worry on Color TV

► THE APPROXIMATELY 7,000,000 present owners of television sets have no cause to worry over the recent decision of the Federal Communications Commission to permit the Columbia Broadcasting System to put its color system on the air commercially. Present broadcasting will continue.

When CBS starts broadcasting in color, present sets, as they are, will not be able to pick up the picture either in color or in black-and-white. But practically all present broadcasting in black-and-white will continue and people will continue to receive and enjoy the programs.

Many will probably never want the color pictures, judging from the history of the motion picture industry. Technicolor was developed years ago but the great majority of all feature pictures are still produced in black and white because of the increased cost of technicolor and the lack of sufficient public demand for motion pictures in color.

For those who would want to enjoy the pictures in color which CBS will put on the air, new receivers will be available. Old receivers can be converted, experts explain, but the cost may be around \$100. Old receivers can be converted to pick up pictures in black-and-white from the transmissions in color at probably half this cost. Must work remains to be done before low-cost satisfactory adapters are developed. The new color receivers will be more costly than present receivers, perhaps by \$100 because they are more complicated.

The CBS system is based on revolving color-filter disks. Such disks are necessary in the receivers as well as in the cameras

Motors to run them are needed. The size of the direct-view picture tube is limited by the size of the spinning color disk that can be used in the home. However, magnifying lenses can be used if desired.

Electronic systems of color television, in contrast to this CBS mechanical system, transmit pictures in color that can be picked up in black-and-white on any television receiver. Because they are transmitted on standards that do not conflict with existing standards for black-and-white they are called compatible. Adapters are needed to receive the CBS pictures on present receivers because they are non-compatible. Considerable work must be done before any of the all-electronic systems reach the highest degree of perfection.

Science News Letter, November 4, 1950

ENGINEERING

Alarms and Recorders Detect Carbon Monoxide

► CARBON monoxide detecting instruments have evolved from unreliable canaries and mice through simple colorimetric devices to practical, continuously operating alarms, indicators and recorders, according to N. W. Hartz of Pittsburgh, Pa.

This expert of the Mine Safety Appliances Company, Pittsburgh, described new gas detecting instruments in Oklahoma City to the American Institute of Electrical Engineers. The carbon monoxide devices are activated by cells of Hopcalite, a catalyst that speeds up the change of carbon monoxide into carbon dioxide. The process causes a temperature rise. This is measured by a thermopile that sends electrical energy to alarms and recorders

The demand for detectors of air pollution has led to the development of instruments to show danger that may come from undesirable gases from industrial plants and other sources. He described instruments to detect poisonous and flammable gases.

Present combustible gas detecting instruments have been simplified to the point where they are composed essentially of an electrical Wheatstone bridge in which a sample is drawn over a heated catalytic filament so that any combustibles present are burned upon contact with the hot wire.

Raising the temperature of the filament, Mr. Hartz stated, increases its electrical resistance in proportion to the percentage of the lower explosive limit concentration. Portable instruments of this type are powered by flashlight dry cells.

At the same meeting W. E. Belcher, Jr., of the Minneapolis Honeywell Instrument Company, described a device that detects unsafe temperatures in rotating machines, particularly in bearings. This new instrument is now about to emerge from the laboratory, he said.

Many applications for this type of instrument were listed by Mr. Belcher.

Science News Letter, November 4, 1950

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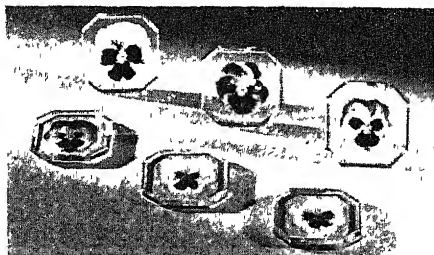
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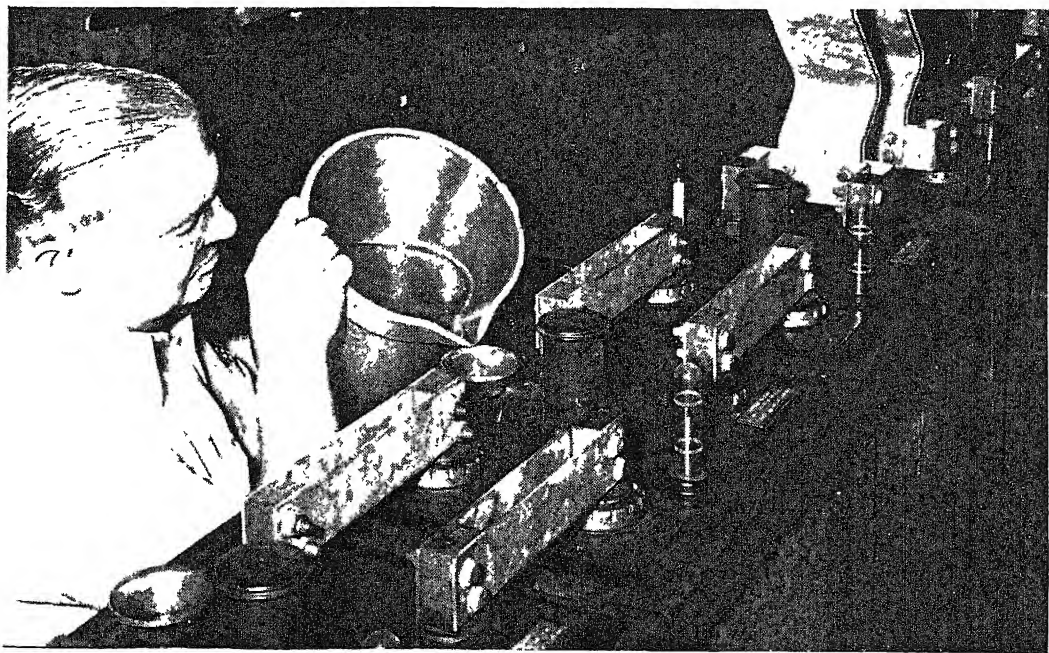
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How a whiff of stibine led toward lower telephone costs

At the New York Telephone Company's Triangle exchange in Brooklyn, emergency batteries stand ready to deliver 3000 amperes for several hours.

In the Bell System there are a million lead storage battery cells connected to telephone circuits in the central offices. Current seldom flows in or out of these cells beyond the trickle which keeps them charged. In the rare event of power failure, however, they stand ready to supply the current for your telephone service.

Even in this stand-by service, cells require water to make up for electrolysis. And they consume power and eventually wear out. But Bell Laboratories chemists discovered how to make a battery which lasts many more years and requires less attention — by changing a single ingredient, the clue to which came unexpectedly from another line of their research.

The clue was a minute trace of stibine gas in battery rooms — detected by electrochemists looking into atmospheric causes of relay contact corrosion. In small traces the gas was harmless but it gave chemists a useful hint.

For stibine is a compound of antimony — and antimony is used to harden the lead grids which serve as mechanical supports for a battery's active materials. Tracing the stibine, the chemists discovered that antimony is leached out of the positive grid and enters into chemical reactions which hasten self-discharge and shorten battery life.

Meanwhile, in the field of cable sheath research Bell metallurgists had discovered that calcium could be used instead of antimony to harden lead. And theory showed that calcium would not react destructively in a battery. The result is the new long-life calcium-lead battery which cuts battery replacement costs, goes for months without additional water, and needs but $\frac{1}{5}$ the trickle current to keep its charge.

It demonstrates again how diverse lines of research come together at Bell Telephone Laboratories to keep down the cost of telephone service.

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AGRICULTURE

NATURE RAMBLINGS



Maize

➤ IN THE mighty harvest of autumn are many things natively American: pumpkins, squash and cranberries, sweet potatoes, tomatoes and turkey, pecans, peanuts, Brazil nuts, black walnuts, chocolate and tobacco.

But of all the Thanksgiving Day bounty which the American Indian bestowed upon the white man—or which the settlers took from him without thanks—the greatest has been corn. It was maize, the Indian corn, which brought the Pilgrims through their first desperate winters of sickness and starvation. Now it is a billion-dollar U. S. crop.

Where this giant grass with the giant ears came from originally is still an unsolved mystery. It probably grew first in the South American highlands, but by the time the European settlers came its cultivation had spread to North America, as far north as the climate would allow. Mummy burials in Peru, Mexico, our own Southwest, have funeral offerings of corn. There is abundant evidence that the mound-builders knew the grain too.

American Indians believed maize was a food of the gods, dropped from their hands

when they flew back to heaven in indignation at man's ingratitude and greed. Some tribes treated the corn as a sacred bird, believing this bird was the seed-bearer who brought corn from heaven.

One early Indian legend tells of the First Mother, born of a beautiful plant. When famine came to the land she begged her husband to kill her and strew fragments of her body over the fields. The Great Spirit told the First Father to obey. He did what his wife asked, and after a time great waving grass sprang from the earth, ripened and was corn.

The Iroquois told another story. A

mighty chief climbed upon a mountain and asked the Great Spirit to send more food for his people, for they were weary of berries and wild game. The Great Spirit bade him go into the fields with his wife and children in the moon of the rains and wait there for three days. This the old man did, and there his family slept. When tribesmen came later, the old chief and his wife and children had turned to corn.

However maize appeared, it was found in America by the Spanish in Florida, John Smith at Jamestown, the Pilgrims at Plymouth. The settlers called the grain Indian corn, and then simply corn.

In 17th century English, "corn" meant all kinds of grain—wheat, barley, rye and all the rest—yet so completely did the new crop dominate colonial agriculture that the word was appropriated for it. Today, with corn a mighty crop across the land, the other bread-grasses our grandsires grew are crowded under the ignominious title "small grains." But the Englishman, perhaps with greater conscience, still calls American corn by its rightful Indian name, maize.

Science News Letter, November 4, 1950

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ENGINEERING

Military Map Making Faster with New Process

➤ FASTER production of military maps was promised in Baltimore by Dr. Bernhard Landow, development specialist of Ansco Research Laboratories.

He reported to the Photographic Society of America a new technique, known as the Hersol process, developed in cooperation with the U. S. Army Map Service. It provides a method for making color separation negatives on contact from line copy. In printing color maps, a separate negative and plate are required for each color on the map.

Development of this process is expected to save time and labor.

Science News Letter, November 4, 1950

On This Week's Cover

➤ A STARFISH, when viewed from the oral surface, exhibits its tube feet to good advantage. When the starfish of the phylum echinodermata is usually seen on a rock or on sand its mouth is at the center of the under surface which is known as the oral surface.

The tube feet are small muscular tubes filled with water and ending in small vacuum discs called suckers. By these the starfish can catch hold of a rock or other object and either moves the object toward itself or pulls its own body toward the rock. The feet also function as sense organs.

Science News Letter, November 4, 1950

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ADVENTURE INTO THE UNKNOWN The First Fifty Years of the General Electric Research Laboratory—Laurence A. Hawkins—*Morrow*, 150 p., illus., \$3.50. Depicts the development of General Electric's Research Laboratory.

AIRWAYS ABROAD The Story of American World Air Routes—Henry Ladd Smith—*University of Wisconsin Press*, 355 p., illus., \$4.00. The story of America's merchant air fleet and of the men who pioneered the caravan routes of the air age.

ANNUAL REPORT 1949—*The Rockefeller Foundation*, 462 p., illus., paper, free upon request to publisher, 49 West 49th St., New York, N. Y. Report on the research advancements in the natural sciences, the social sciences and the humanities which were supported by the foundation in 1949.

BATS FROM NEW CALEDONIA, THE SOLOMON ISLANDS, AND NEW HEBRIDES—Colin Campbell Sanborn and A. J. Nicholson—*Chicago Natural History Museum*, 25 p., illus., paper, 40 cents.

BETTER HEALTH THROUGH BETTER RICE—*Williams-Waterman Fund*, 36 p., illus., free upon request to publisher, 405 Lexington Ave., New York 17, N. Y. Outlines the Philippine program and the steps that may be taken to improve the health of millions of people in the rice-eating nations of the world. (See SNL, Oct. 28, 1950, p. 277.)

THE CARE AND BREEDING OF LABORATORY ANIMALS—Edmond J. Farris, Ed.—*Wiley*, 515 p., illus., \$8.00. Among the animals considered are the rat, opossum, monkey, rabbit, cat, mouse, hamster, and drosophila.

CHARLES DARWIN'S AUTOBIOGRAPHY: With His Notes and Letters Depicting the Growth of the Origin of Species—Francis Darwin, Ed. *Schuman*, 266 p., \$3.50. Presents the essential material found in Charles Darwin's original three-volume work which has long been out of print.

CURRENT TRENDS IN THE RELATION OF PSYCHOLOGY TO MEDICINE—Wayne Dennis and others—*University of Pittsburgh Press*, 189 p., \$3.75. Eight lectures under the auspices of the University of Pittsburgh's Department of Psychology delivered during Feb. 9-10, 1950, in the Stephen Collins Foster Memorial.

THE EFFECTS OF ATOMIC WEAPONS—Samuel Glasstone, Executive Editor—*McGraw-Hill*, 456 p., illus., \$3.00. A commercial edition of the original Gov't. Printing Office publication. See SNL, Aug. 19, pp. 122, 127, and Aug. 26, p. 143.

EXPERIMENTS IN PHYSICAL CHEMISTRY—Otto F. Steinbach and Cecil V. King—*American*, 250 p., illus., \$3.50. A wide variety of experiments accompanied by brief theoretical introductions is presented.

FOREST PRODUCTS RESEARCH GUIDE—Standing Committee on Products and Research—*National Lumber Manufacturers Association*, 4th ed., 335 p., paper, \$5.00. A volume listing research agencies and their activities.

FUNCTIONAL ANATOMY OF THE VERTEBRATES—Daniel P. Quiring—*McGraw-Hill*, 624 p., illus., \$5.50. Various systems of the chordate animal are presented. An advanced college text.

FUNDAMENTALS OF OPTICS—Francis A. Jenkins and Harvey E. White—*McGraw-Hill*, 2nd ed., 647 p., illus., \$7.00. A college text brought up-to-date.

A GENERAL KINETIC THEORY OF LIQUIDS—M. Born and H. S. Green—*Cambridge University Press*, 98 p., illus., \$2.25. A general outline of the statistical theory consisting of six articles originally appearing in the *Proceedings of the Royal Society*.

GENERAL PROCEDURE FOR MANUFACTURING SWISS CHEESE—George P. Sanders, Lloyd A. Burke and Harry R. Lochry—*Gov't. Printing Office*, U. S. Dept. of Ag. Circ. No. 851, 18 p., illus., paper, 10 cents.

HIGH-SPEED COMPUTING DEVICES—Staff of Engineering Research Associates—*McGraw-Hill*, 451 p., illus., \$6.50. Presents various mathematical methods and the physical mechanisms which have been developed for use in automatic computation.

HOW TO SURVIVE AN ATOMIC BOMB—Richard Gerstell—*Combat Forces Press*, 150 p., illus., \$1.95; paper bound edition, *Bantam Books*, 149 p., illus., paper, 25 cents. A book about how you might save your life in case atomic bombs fall. Authoritative, it is available both in a hard cover edition and a newsstand edition. The author is a consultant to the Civil Defense Office of the National Security Resources Board.

IMPORTED VARIETIES OF DATES IN THE UNITED STATES—Roy W. Nixon—*Gov't. Printing Office*, U. S. Dept. of Ag. Circ. No. 834, 144 p., illus., paper, 40 cents.

INTERNAL COMBUSTION ENGINES Analysis and Practice—Edward F. Obert—*International Textbook Co.*, 2nd ed., 596 p., illus., \$7.25. A text written for engineering students.

INTERNATIONAL RELATIONS: In the Age of the Conflict Between Democracy and Dictatorship—Robert Strausz-Hupe and Stefan T. Possony—*McGraw-Hill*, 947 p., illus., \$6.00. The question of the survival or collapse of Western civilization is discussed. One of a political science series.

INTRODUCTION TO ALGEBRAIC GEOMETRY—W. Gordon Welchman—*Cambridge University Press*, 349 p., illus., \$4.50. An advanced college text.

LAWN PROBLEMS OF THE SOUTHWEST: With Supplemental Information on the Selection, Transplanting, and Care of Trees and Shrubs for the Home—Howard J. Dittmer—*University of New Mexico Press*, 76 p., illus., paper, \$1.00.

A MIDDLE DEVONIAN OCTACTINELLID SPONGE FROM NEW YORK—Eugene S. Richardson, Jr.—*Chicago Natural History Museum*, 9 p., illus., paper, 25 cents. A specimen of a fossil sponge is described.

MINERAL COMMODITIES OF CALIFORNIA: Geologic Occurrence, Economic Development, and Utilization of the State's Mineral Resources—Staff of the Division of Mines—*Department of Natural Resources, State of California*, 443 p., illus., \$2.00.

THE MIRACLE OF GROWTH—Museum of Science and Industry, Chicago and the University of

Illinois Professional Colleges, Chicago—*University of Illinois Press*, 73 p., illus., \$2.00. Explains in non-technical language how human beings begin and how they grow. Excellent illustrations.

MODERN CHEMICAL PROCESSES A Series of Articles Describing Chemical Manufacturing Plants—Editors of Industrial and Engineering Chemistry—*Reinhold*, 222 p., illus., \$4.00. Detailed information about 23 recently developed American chemical processes operated on a full-scale production level.

PLANT BIOCHEMISTRY—James Bonner—*Academic*, 537 p., illus., \$6.80. A text for courses in plant or agricultural biochemistry on the advanced undergraduate level.

REPRESENTATIVE AMERICAN SPEECHES 1949-1950—A. Craig Baird, Ed.—*H. W. Wilson*, 264 p., \$1.75. Among the speeches included are those of Truman, Acheson, Urey, Bunche and Reuther.

THE ROCKEFELLER FOUNDATION: A Review for 1949—Chester I. Barnard—Rockefeller Foundation, 85 p., illus., paper, free upon request to publisher, 49 West 49th St., New York, N. Y. Presents the Foundation's program highlights of the year 1949.

SHOULD WE HAVE MORE TVA'S—Walter M. Daniels—*H. W. Wilson*, 225 p., \$1.75. Presents some of the divergent viewpoints.

THE SOLUBILITY OF NONELECTROLYTES—Joel H. Hildebrand and Robert L. Scott—*Reinhold*, 3rd ed., 488 p., illus., \$10.00. A standard reference brought up-to-date.

A STUDY OF THE ELEGANT TINAMOUS GENUS EUDROMIA—Boardman Conover—*Chicago Natural History Museum*, 11 p., paper, 15 cents. A study of some of the members of this family of quail-like South American birds.

A STUDY OF THE SPOTTED TINAMOUS GENUS NOTHURA—Boardman Conover—*Chicago Natural History Museum*, 23 p., paper, 25 cents. A brief study of a few of the family of these quail-like South American birds.

A SYLLABUS OF LABORATORY EXAMINATIONS IN CLINICAL DIAGNOSIS: Critical Evaluation of Laboratory Procedures in the Study of the Patient—Thomas Hale Ham, Ed.—*Harvard University Press*, 496 p., illus., paper, \$5.00.

A SYMPOSIUM ON STEROID HORMONES—Edgar S. Gordon, Ed.—*University of Wisconsin Press*, 396 p., illus., \$6.50. Covers fundamental and applied aspects of steroid research. A symposium held as part of the University of Wisconsin's hundredth anniversary.

THE TEACHING OF SCIENCE IN PUBLIC HIGH SCHOOLS: An Inquiry into Offerings, Enrollments and Selected Teaching Conditions, 1947-48—Philip G. Johnson—*Gov't. Printing Office*, Federal Security Agency Bull. 1950, No. 9, illus., paper, 20 cents.

TRUE FAITH AND ALLEGIANCE: An Inquiry into Education for Human Brotherhood and Understanding—*National Education Association*, 101 p., illus., paper, 75 cents. Prepared by the NEA Commission for the Defense of Democracy through Education.

THE UTILIZATION OF SUCROSE—Leslie F. Wiggins—*Sugar Research Foundation*, 43 p., illus., paper, free upon request to publisher, 52 Wall St., New York 5, N. Y.

• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., Washington 6, D C and ask for Gadget Bulletin 543. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

⚙️ **PLASTIC-COVERED MITTENS** for youngsters and teen-agers are made of warm material coated with waterproof vinylite resin which is flexible even in cold weather and resistant to cracking and peeling. These lightweight but warm mittens are available in red, green and brown.

Science News Letter, November 4, 1950

⚙️ **QUICK HOSE COUPLING** which can be opened under pressure, an English development, consists of two metal parts for each half coupling. The two halves are identical, and a joint is instantaneously made by placing the two halves together and giving a slight twist.

Science News Letter, November 4, 1950

⚙️ **HEAT-RESISTANT MATERIAL**, for lining high-temperature furnaces, is produced from a base of mullite, a well-known super-refractory material, and is said to be equal or superior to the best refractory linings now in use. A special feature is the low cost.

Science News Letter, November 4, 1950

⚙️ **TELEVISION MICROPHONE** for both speakers and singers is an unobtrusive cane-like device, as shown in the picture, that affords the public a better view of the entertainer. The easily-held, one-pound device



is as sensitive as the finest broadcasting microphones.

Science News Letter, November 4, 1950

⚙️ **IMPACT WRENCH** is a small cylindrical tool that is placed upright over and in contact with a nut at the time its

upper end is struck with a hammer. By means of a cam-like device, the impact of the hammer is translated into a rotary motion to turn the nut.

Science News Letter, November 4, 1950

⚙️ **DEXTROSE TABLETS** of various vegetable sources, and agar tablets, are now available for the preparation of culture media for growing microorganisms in scientific laboratories. To prepare media, a tablet is put into a small amount of distilled water and shaken.

Science News Letter, November 4, 1950

⚙️ **BUNSEN BURNER**, to provide the gas flame used in laboratories, is on one side of a base with a platform that regulates the flame size. When not in use, a tiny pilot-light continues to burn. When the platform is touched by finger or hand, the full hot flame immediately appears.

Science News Letter, November 4, 1950

⚙️ **SPARK PLUG WRENCH** for aircraft engines has a patented feature for holding the plug during its installation or removal. It simplifies the job of handling the spark plugs, which are often in hard-to-get-at places on complicated engines, and lessens danger to plugs from dropping.

Science News Letter, November 4, 1950

Do You Know?

Ability to taste may have some connection with the thyroid gland.

Gardens that are riots of color in sunlight are practically colorless in moonlight.

Many tons of sugar are used in the manufacture of dynamite, mixed with the glycerine before nitrating, sugar yields a nitroglycerine less likely to freeze.

Atomic power will come first in ship propulsion, it is predicted, vessels are able to carry the six-foot concrete shield needed around an atomic pile, the atom smasher.

Umbrella birds of the Andes mountains, jet-black and crow-size, have large crests of filmy feathers which can be thrown forward and outward to form a protection over eyes and beak.

Different fragrances to impart pleasing odors should be used in various rooms, an expert says; an exhilarating odor is suggested for a party room and a relaxing odor for bedrooms.

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November 11, 1950

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

7 6 DEC 1950



Independent Underwater Camera

See Page 306

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VOL. 58 NO. 20 PAGES 305-320

GENERAL SCIENCE

Student Deferment Urged

Another scientific manpower plan is proposed. Interdepartmental group advises a National Scientific Service and virtually complete science student deferment.

➤ DEFERMENT of virtually all college students in scientific and engineering fields and removal of the drafting of scientists and engineers from the hands of Selective Service has been recommended to the President by the Interdepartmental Committee on Scientific Research and Development.

Selective Service Director Lewis B. Hershey does not agree with these recommendations, he told Science Service in Washington, D. C. Neither do advocates of Universal Military Service.

The Armed Forces members of the Interdepartmental Committee did not go along with the other eight civilian agency members in the recommendations.

The committee suggested that: A National Scientific Service be established as soon as possible. All scientists and engineers, including students in training, be registered in order to provide a basis for enrollment in the National Scientific Service. A Scientific Resources Committee be established under the National Security Resources Board to be responsible for plans and decisions on scientific manpower resources.

This would mean that every scientist, technician and engineer, young and old, male and female, and every student in those fields would be required to register with the National Scientific Service. It is estimated that would be more than a million people. However, it is assumed that only the younger, physically fit males would be drafted into the military service during partial mobilization.

The committee stated that, "we cannot safely decrease the number of college graduates in engineering and science below the number graduating this year. An irreparable loss of young men at any time in the next few years might easily be the difference between success and failure in a war of long duration or total war several years ahead of the present."

General Hershey pointed out that, by deferring students in specific fields, such as science and engineering, the committee was going back to a World War II idea that didn't work.

"In general," he declared, referring to six Selective Service Advisory Committees which recommended deferment of high level college students regardless of fields of study, "I am supporting those committees of mine. They want across-the-board deferment of students with high capacity or superiority—call it whatever you want—rather than students in specialized areas. After all, how much chance for deferment

would an A-scientist or a Japanese culture specialist have had in 1935?"

Local boards rather than a National Scientific Service should do the drafting for everybody, the General thinks.

"If we let bankers, farmers and scientists draft bankers, farmers and scientists, how many do you think will get drafted?" General Hershey asked. "These people are all citizens first and, in a democracy, their fellow citizens on the draft boards can make the decisions."

The four Defense Department representatives on the Interdepartmental Committee were said to have abstained because of differences within the department on manpower. The differences are between personnel officials who must maintain an armed force of 3,000,000 men with only 1,050,000 turning 19 each year, and logistics officials who must supply that armed force with the latest technical advances in weapons and therefore want the scientific manpower deferred.

The personnel officials are among the strongest advocates of Universal Military Service which conflicts with the concept of deferring students in scientific and engineering fields as expressed by the Interdepartmental Committee.

Science News Letter, November 11, 1950

ENGINEERING

Hums of Transformers Can Be Controlled

➤ DISTURBING "hums" from electric transformer stations in residential sections must be controlled, the American Institute of Electrical Engineers was told in Oklahoma City by Corbett McLean, Pacific Power and Light Company, Portland, Ore. Several methods were suggested.

These transformers, which step-down high-voltage current to voltages suitable for use in houses, give less hum if constructed of the right kind of steel.

But even in identical unit substations included under the same purchase order there may be an extreme variation in sound levels. The solution of this, according to Mr. McLean, is for engineers to press manufacturers for more uniform assembly with noise level as important features in the design.

Other suggestions include the locating of transformers at least 100 feet from the nearest building and also the use of sound confining enclosures. Whether the higher costing low-hum transformers or sound con-

fining enclosures will be used is a question of which is the more economical.

The increasing population and the greater noise consciousness of the public have created a problem which electric power companies must solve, he indicated. Low frequency transformer hum is apparently a noise to which the average resident has not been accustomed. It differs from the routine traffic disturbances which the public knows. Eradication of this disturbance is an important matter to power companies.

Science News Letter, November 11, 1950

INVENTION

Detector of Flaws in Rail Joints Makes Travel Safer

➤ GREATER safety in railroad traveling as promised with an improved electrical device to detect invisible flaws in rails on which the government issued a patent recently.

This device is an improvement over older types because it will detect flaws near rail joints, which others fail to do. Rail joints actuate the mechanism of ordinary detectors of older types. This results in the concealment of flaws within the region affected by the angle bar connector.

Patent 2,527,002 was issued to Harcourt C. Drake, Hempstead, N. Y., for this device. Rights have been assigned by him to Sperry Products, Inc., Danbury, Conn.

Science News Letter, November 11, 1950

On This Week's Cover

➤ THE FIRST completely mobile 35 mm underwater motion picture camera used by the U. S. Navy makes the diver-photographer entirely independent of surface assistance. G. E. Darral is shown demonstrating the camera on this week's cover of SCIENCE NEWS LETTER.

Independent of air supply and electric cables leading to the surface, it is designed so that it can be completely operated from the outside of the housing. The wings, acting as a planing surface, enable the diver-photographer when sighting through the view-finder to kick his flippered feet and guide himself by tilting and banking the camera similar to a plane in the air.

The underwater photographer is equipped with an "Aqualung," an automatic compressed air, self-contained diving unit and "swim-fins" for his feet. Outfitted in this fashion, the diver-photographer is able to swim with the camera in any direction or to any depth down to approximately 200 feet.

This new technique of motion picture photography has been developed to provide a series of films to aid in the training of the U. S. Naval Deep Sea Divers. (See SNL, Oct. 28, p. 295 for full story.)

Science News Letter, November 11, 1950

GENERAL SCIENCE

Foundation Board Named

The scientists who will mold the policy of the National Science Foundation have been named by President Truman. Sixteen states are represented.

➤ THE 24 board members of the National Science Foundation, appointed by President Truman to make national policy for scientific research and education and administer government grants, are representative of all sections of the nation and the broad fields of science, engineering and industry

Among the membership are seven university presidents, heads of two big foundations, 11 deans, department heads, or professors of colleges, two industrial presidents. Sixteen states and the District of Columbia are represented on the board of 24

Professionally, the board includes four biologists, four chemists, four educators, two engineers, one geologist, two industrialists, one mathematician, three medical scientists, and three physicists

Two women are on the board and one of them, Dr. Cori, is the only Nobel prize winner in the group. The board includes two Negroes, one a chemist and the other a college president.

The members appointed are Dr. Sophie D. Aberle, special research director, University of New Mexico; Dr. Robert P. Barnes, head of the chemistry department, Howard University; Chester I. Barnard, president, Rockefeller Foundation, Dr. Detlev W. Bronk, president, The Johns Hopkins University; Dr. Gerty Theresa Cori, professor of biological chemistry, Washington University Medical School, Dr. James Bryant Conant, president, Harvard University; Dr. John W. Davis, president, West Virginia State College; Charles Dollard, president, Carnegie Corporation, Dr. Lee A. Dubridge, president, California Institute of Technology; Dr. Edwin B. Fred, president, University of Wisconsin; Dr. Paul M. Gross, dean of Duke University Graduate School; Dr. George D. Humphrey, president, University of Wyoming; Dr. O. W. Hyman, dean of medical school and vice-president, University of Tennessee; Dr. Robert F. Loeb, Bard professor of medical services, College of Physicians and Surgeons, Columbia University, and Dr. Donald H. McLaughlin, president of Homestake Mining Co., San Francisco, Calif.

Others are Dr. Frederick A. Middlebush, president, University of Missouri; Edward L. Moreland, partner, Jackson and Moreland, Boston, Mass.; Dr. Joseph S. Morris, head of the physics department and vice-president of Tulane University; Dr. Harold Marston Morse, professor of mathematics, Princeton University; Dr. Andrey A. Potter, dean of engineering, Purdue University; Dr. James A. Reyniers, director of bacteriology

laboratories, Notre Dame University; Dr. Elvin C. Stakman, chief, division of plant pathology and botany, University of Minnesota; Charles Edward Wilson, president, General Electric Co., and Rev. Patrick Henry Yancey, professor of biology, Spring Hill College.

Science News Letter, November 11, 1950

MEDICINE

Sugar Handy Aid For A-Bomb Victims

➤ SUGAR can supply two medical aids to any future atom bomb victims, Dr. Robert C. Hockett, director of the Sugar Research Foundation, reported to the American Public Health Association meeting in St. Louis

One of these is dextran, a water-white mucilaginous compound produced only from sugar by the action of certain bacteria. It could be used as a substitute for blood plasma and can be produced cheaply.

The second sugar aid to atom bomb victims described by Dr. Hockett is invert sugar. This is a liquid mixture of dextrose and levulose easily made from common sugar. In the ordinary process of digestion, the body converts sugar to invert sugar. But for patients who cannot eat and must be nourished by solutions injected into their veins, invert sugar is a "superior nutriment," Dr. Hockett said. Trials on patients show that the levulose fraction of sugar is apparently what causes improved metabolism and nourishment of the patients given this kind of sugar by veins.

Science News Letter, November 11, 1950

AERONAUTICS

JATO Rockets Use Smokeless Powder

➤ BOOSTER rockets, used to help get fighter planes quickly into the air from the decks of Navy carriers, need no longer cloud the vessel in smoke.

A new rocket, developed for the Navy by the Allegany Ballistics Laboratory, Cumberland, Md., uses smokeless powder for fuel. Although the new unit weighs considerably less than present types, it provides an equal amount of thrust.

Rockets used to provide extra power to planes at the takeoff are called JATO for short. The letters stand for "jet assisted take-off." They are used on carrier decks and short runways at airports to get planes

into the air more quickly than can be done by engines alone. The rockets are dropped when they have done their job.

Smokeless powder has been used for some time as a propellant charge for military and naval guns. This is said to be the first JATO to employ it. For its development, both Army and Air Force contributed funds. All three services plan to use the new rocket.

Science News Letter, November 11, 1950

DENTISTRY

Five Chemicals Seal Tiny Teeth Openings

➤ FIVE substances that can penetrate the entire structure of the teeth, going through enamel defects and decayed areas and plugging the tiny perforations known as lamellae, were reported by Dr. William Ward Wainwright of the University of Illinois College of Dentistry, Chicago, at the meeting in Atlantic City of the American Dental Association.

The five substances are calcium chloride, silver nitrate, palladium chloride, sodium iodide and copper nitrate.

The extent to which the tiny perforations are plugged and the nature of the substance doing the plugging seems to have much to do with the incidence of tooth decay, it was pointed out.

"Certainly the vulnerability of the tooth



MAPS NEEDED—Robert L. Williams, Yale's newly appointed cartographer, makes a map in Yale's newly established Cartography Laboratory in the University Library. The laboratory, one of the few of its kind in U. S. educational institutions, has been set up to meet the increased demand for maps in classroom teaching.

is increased by the presence of so many permeable tracts," Dr. Wainwright said.

Zinc chloride also could penetrate the lamellae, decayed areas and other defects. Nearly all the lamellae could subsequently be plugged by other substances, however, so they were not considered permanently plugged.

Plutonium, atom bomb material, when used in a citrate complex did not penetrate decayed areas and defects. It attached itself to the surface of the enamel.

Discovery of this vulnerability of the tooth, said to be of prime importance in the prevention and treatment of tooth decay, was made by applying the substances in their radioactive form to teeth that had been extracted. After treatment with the radioactive chemical, the teeth were dissected and the dissected portions applied directly to X-ray film. This gave radioautographs of the teeth for study of their structure.

Science News Letter, November 11, 1950

METEOROLOGY

Warmer and Drier November for U. S.

➤ THE last two weeks in November will be warmer and drier than usual over most of the nation. However, the Pacific Coast including Washington and Oregon, and parts of Idaho, Montana, Utah and Nevada will have more rain or snow than usual.

Thus the U. S. Weather Bureau's extended Forecast Section, in its regular twice-a-month, 30-day forecast, offers little hope for relief to the flood-threatened Northwest.

Temperatures of the southern Rocky Mountain states will go higher than those of most of the nation in November. They are expected to be "considerably" above normal, the Weather Bureau says. Only northern New England and northwestern Washing-

ton will be colder than usual and then only slightly so.

Near normal rain or snow is expected only along the nation's northern border and in the northeast.

Science News Letter, November 11, 1950

BOTANY

Predict Apples That Do Not Turn Brown in Air

➤ APPLES for your Waldorf salad that will not require any special attention to keep them from turning brown in the air were predicted.

"Apple breeders now have available to them a German apple with this desirable trait. If there is sufficient demand for an American apple that will not turn brown when exposed to air, then I see no reason why the breeders can not develop it."

So states Dr. William E. Whitehouse of the U. S. Department of Agriculture's Plant Industry Station, Beltsville, Md., in charge of introductions for the improvement of fruit and vegetable crops.

There is one German apple now available with a non-oxidase system, that is, a system that will not turn brown, or oxidize, when exposed to air. Two other apple varieties with this same trait have been discovered within the past year and these will also be made available to breeders.

Dr. Whitehouse also predicted the possibility of improving present day apple varieties by breeding those with increased vitamin C content, with the spice-like flavor found in some English apples and with the smooth, after-cooking flesh texture found in certain German and New Zealand apples.

The world-wide search for apples with desirable traits was begun over 15 years ago. Since it takes about eight years for a tree to bear fruit and since frost delayed bearings for five years in a row, the rich collection of foreign varieties is just be-

ginning to be distributed to breeders. Over 1,500 varieties have been rounded up, and only 700 of these have so far had their characteristics thoroughly studied, Dr. Whitehouse stated.

Science News Letter, November 11, 1950

All the sugar in the bread dough does not remain as sweetening; some is converted by the yeast into carbon dioxide and alcohol gas which causes the bread to rise.

SCIENCE NEWS LETTER

VOL 58 NOVEMBER 11, 1950 No. 20

43,400 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C., NORTH 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50, 2 yrs., \$10.00, 3 yrs., \$14.50, single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925, 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to periodical literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago STATE 4439.

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Photographs: p. 307, Yale University News Bureau; p. 309, Weyerhaeuser Timber Company, p. 311, Westinghouse; p. 315, Walter George Gall.

PSYCHIATRY

H.T.'s Attackers Not Ill

An assassination attempted by more than one person, especially when they belong to organized group, is not likely to be act of mental illness.

► THE CHANCES are that the attempted attack on the President's residence, the Blair House, was not the act of mentally ill persons.

This is the opinion of Dr. Frederic Wertham, New York psychiatrist and author of a recent book on murder, *THE SHOW OF VIOLENCE*.

When a single person kills or attempts to kill a ruler or leader, that is often the act of a mentally ill person. It is scientifically called "magnicide," meaning the killing of someone big.

But when two persons act together in an attempted assassination, as they did in this case, and when these persons are members of an organized political group engaged in a political uprising, the act should not be viewed as psychiatric but rather a social or political happening.

This is the opinion of Dr. Wertham, expressed to Science Service by telephone. Dr. Wertham was, of course, speaking generally, in the absence of any direct information about the men who tried to shoot their way into the Blair House.

The assassin of former President McKinley was an insane person, as was also the man who made an attempt on the life of the late President Roosevelt before his inauguration. These were men, acting alone, driven by their own abnormal impulses and a desire to kill a big man in the public eye.

Although the President's residence is visited each year by a large number of "cranks," who are all potentially dangerous, they are, with few exceptions, harmless, quiet and well behaved.

A study of the psychotic visitors to the President and to other public offices in Washington was made a few years ago by Dr. Jay L. Hoffman, then of St. Elizabeth's Hospital and reported to the American Psychopathological Association.

"These patients are, in general, a pitiful lot," he reported. "They are frequently of foreign birth or extraction, without friends or family, well along in years, wanderers, unemployed, and completely unaware of the abnormality of their ideas and behavior."

"One may search the stories of their lives without finding much cause for happiness or satisfaction."

Only five out of 53 patients studied were married. Frequently there were no relatives or friends sufficiently interested in the patient to respond to correspondence from the hospital. A number had been raised in orphan asylums or foster homes. Most of those of foreign birth had no relatives in this country.

Their stories form a contrast to that of the two Puerto Rican Nationalist Party members who shot the White House guards defending the President's residence.

Science News Letter, November 11, 1950

PHYSICS

Extreme Cold Key to What Makes Steel Really Hard

► EXTREME cold has been the key to a new understanding of what makes steel really hard, Dr. James R. Killian, Jr., president of the Massachusetts Institute of Technology, stated at the University Club in Cleveland, Ohio.

Recent studies at M. I. T. have gone a long way toward a solution of the age-old problem of the mechanism of how steel hardens, he said. The same research, he added, has cast uncertainty on many low-temperature theories by showing the possible role of extreme cold in the hardening of steel.

Dr. Killian was discussing cold in the region near absolute zero, which is approximately 460 degrees below zero on the Fahrenheit scale. The recent studies at M. I. T. show that the atoms in steel can rearrange themselves in the process which

makes steel hard even at the extremely low temperatures of liquid helium, 453 degrees below zero.

This discovery, he declared, refutes many ideas of low-temperature behavior. These ideas have assumed that the mobility of atoms decreases as their temperature goes lower and lower. These ideas implied that all atomic movements cease at extremely low temperatures and that no changes such as the hardening of steel may occur.

Instead it appears that steel hardening takes place more completely at low temperatures than at any others, he declared. The new studies indicate that steel hardening is a cooperative shear-like "sliding" in which atoms move in unison. At extremely low temperatures large groups of atoms in steel appear to participate in this sliding motion and thus are transformed from a soft form known as "austemite" to a hard form known to metallurgists as "martensite."

Science News Letter, November 11, 1950

BOTANY

Tree Production Speed-Up By Wires, Cutting Roots

► A SPEED-UP of from 12 to 16 years can be applied successfully to the production of better hybrid trees.

Dr. Syrach Larsen of the Danish plant experimental station, Krogerup, reports that he has forced ash trees to bear seeds in three or four years. Under normal forest conditions, the trees would have taken 15 to 20 years to propagate.

His method is to plant the best hybrid young saplings. When the young trees are about three years old, he pushes them into



GIRTH CONTROL—These seed trees have been temporarily steel-banded to force extra cone and seed production for quicker reforestation of nearby harvested area. Theory is to scare tree into thinking that it is dying which causes it to divert food energy to seed production.

maturity by cutting off half of the roots or by wrapping a wire around the trunk. The tree, thus hurt, produces seeds far ahead of time to be sure that there will be other trees to continue the species.

When the pressure is removed from the injured tree, it returns to normal health.

The wire method is also being used in western Washington forests (see picture, p 309)

Science News Letter, November 11, 1950

DENTISTRY

Fluoridation Cuts Caries

► **FLUORIDATION** of the water supply in Newburgh, N. Y., for the last four years has resulted in a 32.5% drop in the rate of tooth decay among the town's school children. Dr. David B. Ast, director of the bureau of dental health of the New York State Department of Health, reported at the meeting in Atlantic City, N. J., of the American Dental Association.

By contrast, the decay rate in the neighboring town of Kingston has remained the same that it was four years ago.

Newburgh and Kingston are two guinea pig towns which have been putting on a large scale trial of the value of adding sodium fluoride to the water supply for checking tooth decay. The towns are of

about the same size and characteristics. At the beginning of the fluoridation trials, the rate of decayed, missing and filled teeth among some 3,200 school children of Newburgh was 20.6 per 100 permanent teeth. The Kingston rate was 20.2

The difference in decay rates now, Dr. Ast said, cannot be attributed to any differences in the amount of corrective dental service in the two cities.

Fluoridation of water supplies, he said, may ultimately reduce the tooth decay problem to the point where "the present dental personnel and facilities may be able to control this almost universal disease"

Science News Letter, November 11, 1950

ENGINEERING

Ozone as Preservative

► **THE VALUE** of ozone in preserving eggs, fruit and meats in storage is reviewed in a leaflet issued in New York by the American Society of Refrigerating Engineers. It was prepared by Dr. A. W. Ewell, ozone consultant of Westinghouse Electric Corporation.

Ozone is a form of oxygen with three atoms of oxygen instead of the two normally present. This special three-atom form of oxygen is found in very small amounts in fresh air.

Ozone can be produced from the oxygen in the air by several means. Important among these means is a device known as the ozonator which produces ozone by an electric discharge. A more simple ozone producer is an ultraviolet lamp.

In the presence of bacteria, molds, odor and taste-carrying vapors, and many other oxidizable substances, ozone loses its extra atom, thus making it the most powerful oxidizing gas known. It burns up the bacteria. Ozone has an advantage over other oxidizers because the only residue it leaves is common oxygen. In the quantities used in storage plants it is ordinarily harmless to human beings.

The most important use of ozone in storage plants is in egg rooms, according to Dr. Ewell. A high humidity is necessary in egg-storage rooms to reduce shrinkage. This high humidity is favorable to mold growth, but the mold growth can be controlled by ozone. When the proper amount of ozone, a relatively small quantity, is used in the egg room, and a temperature of 31 degrees Fahrenheit and a humidity of 90% are maintained, eggs after eight months'

storage, he says, are indistinguishable from eggs a few days old.

Experiences with ozone in the storage of apples, small fruits and meats are reviewed by Dr. Ewell. Its use in destroying odors other than putrefaction in cold storage rooms and ship holds is also reviewed. Storage goods subject to rancidity, such as butter, lard and fats, must be excluded from prolonged storage in even low concentrations of ozone, he states

Science News Letter, November 11, 1950

MEDICINE

Skin Resistance Measures Deafness in Children

► **HEARING** impairment in babies as young as four months old can be diagnosed with great accuracy through a new testing method developed by Drs. John E. Bordley and William G. Hardy of the Johns Hopkins Hospital and Medical School, Baltimore.

They described the method at the State and Territorial Health Officers Conference in Washington.

Hearing defects need to be picked up at as early an age as possible, they stressed. Children with hearing impairment should have whatever treatment and special training they need before they start to school. Hearing aids, like eyeglasses, can be fitted to very young children. There are "dozens and dozens" of different kinds of hearing problems, the Hopkins scientists pointed out. Not all of them can be answered "by shouting more loudly."

The new test is one for measuring the least possible loudness at which pure tones can be heard. This is called pure-tone audiometry. Ordinarily it involves the cooperation of the person being tested, who must signal when he hears a test-tone. Babies and very young children, however, cannot be tested by this method. So the Hopkins scientists make use of skin resistance methods.

The underlying idea for this is that when humans are stimulated in various ways, sweating occurs. As a result, the skin's resistance to the passage of minute electric currents is reduced. This change in resistance can be amplified and plotted on a moving drum to give a visible record of the response to the stimulus.

To use this method in hearing tests, the child is first conditioned to develop skin resistance changes in anticipation of a standard sound. This is done by giving a light, painless electric shock a few seconds after a standard sound used as a stimulus. When the child has been conditioned, so that he regularly shows a change in skin resistance following the sound stimulus, the tone is gradually reduced in loudness until it reaches a point where the child can no longer hear it. Even when the child is too young to say whether or not he hears the tone, the point of no hearing can be told by the fact that there is no change in skin resistance

Science News Letter, November 11, 1950

AERONAUTICS

Near-Vacuum Chamber Tests Supersonic Propellers

► **AN** underground chamber from which most of the air is removed will be in use early in 1951 in carrying out various mechanical tests upon supersonic propellers for airplanes.

It is a steel cylinder nearly 13 feet in diameter and eight feet high, sunk below ground level and covered by a removable low steel dome. Within the chamber, propellers are rotated horizontally. Before a test is started approximately 99% of the air is removed from the chamber so that a low-horsepower engine can be used to rotate the propeller at high speeds.

This new type of propeller-testing device was developed in Dayton, Ohio, by Aero-products Division of General Motors under contract with the U. S. Navy. It is designed to accomplish various mechanical tests upon supersonic propellers, also being developed under contract with the Navy and the Air Force.

Information concerning the supersonic propellers under development cannot yet be revealed. However, it is known that the blades are thin with a tapered plan form. They are for probable use in the planes powered with high horsepower gas turbine engines of the types called turbo-prop. Present supersonic planes are powered with turbo-jets.

Science News Letter, November 11, 1950

DENTISTRY

Replacement of Teeth

The use of inert metals for tooth roots has made the transplantation of teeth possible. One such replacement is now in its twelfth year in a human jaw.

➤ ARTIFICIAL tooth roots of changeless metal can be implanted into human jaws. This technique gives promise of solving one of the most troublesome dental problems.

Attempted for centuries unsuccessfully, the American Dental Association meeting in Atlantic City was told that such tooth replacement is now possible.

Cobalt-chromium alloy screws have been implanted experimentally in a dog and in some humans. One is now in its twelfth year in a human jaw, Drs. A. E. and M. S. Strock, Boston dental scientists, reported.

Success in the transplantation of extracted, fully formed, natural teeth has been limited only by the gradual destruction of the tooth roots, the Boston dentists pointed out. Past attempts to implant metal roots probably failed, they said, because of the reaction of the tissues to the metal. Inert metals which do not react

with tissues were unknown at the time of earlier tests.

The dog that had a cobalt-chromium alloy screw implanted in its upper jaw, where a tooth had been missing, did not have any inflammation or abnormality and was able to eat a regular diet. The screw remained firm and immovable without giving any trouble until the dog died more than two years later. Examination showed that there had been no reaction to the screw by the mouth tissues and that the surrounding teeth were normal.

Some of the screws implanted in human jaws became movable. Microscopic examination showed that a membrane had lined the screws and it became obvious that the implants were being rotated on the membrane. It was decided, however, to keep the screws in and some of the implants now in place have been movable for years.

Science News Letter, November 11, 1950

GENERAL SCIENCE

Ills Show in Fingerprints

➤ CERTAIN illnesses may leave their mark in the fingerprints of the patients. This is the suggestion made by F. R. Cherrill, chief superintendent-in-charge, Finger Print Branch, New Scotland Yard.

The ridges and the fingerprint patterns they form do not change. They are the same in sickness and in health, from infancy to old age, and even after death. But there are other markings found in the fingerprints of some persons. These are creases which show up in the fingerprint as white lines which cross the paths of the ridges at acute angles.

Examination of a large number of prints of apparently normal persons ranging in age from 16 to 75 years shows that 11% to 12% have these white lines, Inspector Cherrill reported in the British science journal, *NATURE* (Oct. 7).

The white lines are mostly confined to the middle, ring and little fingers of the left hand.

The white lines can develop even after death. An aged woman, 90 years old, was fingerprinted twice after her death. The first set of prints showed no white lines, the second set taken two days later showed them plainly in the left ring finger and the left little finger.

Inspector Cherrill was led to make his study of the white lines in the fingerprints

of sick persons from his observations of attempts to fingerprint dead bodies. The left hand shows signs of greater or more rapid decomposition than the right.

Since the left hand, he reasoned, is more susceptible to changes after death, perhaps the left hand of a living person might be more susceptible to changes caused by disease. His study of the fingerprints of diseased persons lent support to this idea.

Science News Letter, November 11, 1950

CHEMISTRY

Mica Flakes Are Secret Of "Sandwich" Paint

➤ MICA flakes are the secret of success of a new, three-decker corrosion-resistant paint developed in Sharon, Pa., by the Westinghouse Transformer Division.

It is primarily for protecting the familiar steel neighborhood transformers which step down the electrical voltage from distribution lines so that the current may be safely used in buildings. Other applications are possible, however, particularly where sea-coast atmosphere makes other paint coatings unsatisfactory.

The mica flakes are used in the middle coating of this triple protective covering, and are embedded in a syrup-like plastic.

They ward off the attacks of moisture and oxygen, principal causes of rust. J. G. Ford, Westinghouse engineer, states. They also increase the heat resistance of the middle coat as much as ten times at high temperatures.

The inner coating of the three-decker paint is a special primer that clings tightly to the steel surface and seals it from contact with the air. The second coat with its pigment of mica flakes, is then applied and allowed to dry. The third coat is applied to give the transformer a pleasing appearance and to shut out ultraviolet radiation from the sun. All three coats are necessary. Each layer adds to the strength and resistance of the others.

Science News Letter, November 11, 1950

INVENTION

Nobelism Fermi Awarded Patent on Atomic Device

➤ NOBELIST Enrico Fermi, the scientist who directed the building of the world's first chain-reacting pile, has been granted a patent on one of his atomic devices, the Atomic Energy Commission announced in Washington.

The neutron velocity selector, as it is called, measures the speed of neutrons as they leave an atomic pile or a particle accelerator. The government owns the patent, No. 2,524,379, awarded to Dr. Fermi, a University of Chicago physicist. It is held by the AEC, which will grant non-exclusive, royalty-free licenses for its use.

Science News Letter, November 11, 1950



PAINT SANDWICH—Still bright and shiny after 1,000 hours of continuous exposure to corrosive salt water spray is the distribution transformer tank at left, which is coated with a new three-decker paint. The tank at right, coated with a standard finish, quickly fell victim to the salt water attack.

DENTISTRY

Gritting Teeth in Sleep Can Injure Gums

➤ IF YOU clench, grit or bite your teeth while you are asleep, you may injure the gums and other tissues supporting the teeth, Drs. Oliver C. Applegate and Roland O. Nissle of the University of Michigan declared at the meeting in Atlantic City, N. J., of the American Dental Association.

Most people put the greatest pressure on their teeth while asleep, the Michigan dentistry professors found. The force applied while eating on the other hand is intermittent for short periods, and is both stimulating and beneficial, they stated.

Patients having some of their teeth replaced by false ones (partial dentures) should wear a special wax rim in their mouths during sleep, Drs. Applegate and Nissle advised.

The appliance will have been completed except for installation of the teeth and thus the wax rim will be supported securely, they said. The wax will record the points of greatest stress and the teeth can be adjusted from this pattern to eliminate the stresses.

Science News Letter, November 11, 1950

PSYCHOLOGY

Cue to Marital Happiness: Follow Own Ideals of Role

➤ A HAPPY husband probably has a wife who is unhappy.

This is the surprising finding of Dr. Robert S. Ort, of Wabash College, from a study of 100 married students or student's wives. Half the subjects were husbands, half wives.

Your happiness in marriage depends, Dr. Ort found, on the extent to which you live up to your own ideas of your role as husband or wife. It also depends on the way your mate lives up to what you think is his or her part.

Here are some other of Dr. Ort's findings:

Husbands are less happy than their wives. And husbands report more difference between their ideals and actuality in their marriages.

Chief source of disappointment of husbands in themselves is in not keeping themselves as clean and tidy as they did during courtship. They also feel guilty about not getting little surprise gifts as tokens of affection for their wives and about not laying down the paper to express affection at their wives' approach.

Chief disappointment of husbands in their wives lies in the fact that the wife does not make love to him at least half the time, as he thinks she should.

Both husbands and wives are more disappointed in themselves than in their mates.

No significant difference was found be-

tween happy couples and unhappy couples in either their expectations or the roles they actually play.

Happy and unhappy couples do differ in the way they go about resolving their differences. A large proportion of happy couples solve their problems by talking them over, only 15% resort to aggression or avoidance.

In general, the couples interviewed consider themselves happy, 42% rated themselves as being as happy as anyone they knew.

Details of Dr. Ort's study are reported in the JOURNAL OF ABNORMAL AND SOCIAL PSYCHOLOGY (Oct.).

Science News Letter, November 11, 1950

ZOOLOGY

"Miracle Drugs" Increase Fertility of Bulls

➤ IN a new miracle of the "miracle drugs," two antibiotics, penicillin and streptomycin, have markedly increased the fertility of semen from five low-fertility bulls at Pennsylvania State College.

The discovery may make these drugs important new tools in the growing artificial insemination practice of the U. S. cattle industry.

Treatments with penicillin, streptomycin or a combination of the two brought "highly significant" increases in the fertility of semen solutions, it was revealed in the annual report of the Agricultural Experiment Station at State College.

Experiments with aureomycin, newest of the antibiotics, are now in progress. Preliminary results indicate that this drug, however, is more toxic to bull spermatozoa than penicillin and streptomycin.

Science News Letter, November 11, 1950

MEDICINE

Light Flashes Lead to Brain Tumor Location

➤ A NEW machine to help doctors locate brain tumors and follow thyroid conditions under treatment with radioactive iodine was shown at the joint conference in New York of the American Institute of Electrical Engineers and Institute of Radio Engineers.

Instead of using a Geiger counter to detect radioactive chemicals injected into the body for diagnostic purposes, the new machine uses a scintillation counter. Tiny flashes of light, instead of the more familiar clicking sounds, signal the radioactivity. A special electronic circuit counts the flashes.

The new machine, developed by the Nuclear Instrument and Chemical Corporation of Chicago, is a compact instrument packaged in a unit to be "plugged in and immediately provide diagnostic answers." It was developed from a more elaborate research unit designed for Northwestern University Medical School.

Science News Letter, November 11, 1950



ICHTHYOLOGY

Fish Are Noisy In Narragansett Bay

➤ THE FISH in Narragansett Bay are a noisy lot. That is the conclusion three scientists reported recently to the Acoustical Society of America meeting in Boston.

Drs. Alton S. Kelsey, Jr., and R. T. Beyer of Brown University, Providence, and Marie P. Fish, Narragansett Marine Laboratory, made recordings of the sounds made by various fish in the Bay area. Of the 25 species they studied, six made significant amounts of noise.

These were the red-winged and common sea robin, the toad-fish, the long-horned sculpin, the puffer and the burrfish.

Science News Letter, November 11, 1950

GENETICS-DENTISTRY

Heredity Factor in Causing Buck Teeth

➤ A DENTAL pattern running through some families, rather than thumbsucking, is the cause of buck teeth and other kinds of poor alignment of the teeth, in the opinion of three University of Pennsylvania scientists.

The scientists, Drs. John W. Ross, Wilton M. Krogman and Moe B. Markus, reported their studies of hundreds of cases of malposition of teeth at the meeting in Atlantic City of the American Dental Association.

In all the cases studied they found only one in which they thought thumbsucking contributed to the poor position of the teeth.

"Today, we believe that habits are only an associated condition and the most that can be ascribed to them is that they may cause an exaggeration of the original pattern of occlusion (meeting of the upper and lower teeth)," Dr. Ross stated.

"It must be remembered that the genetic background, the inheritance, determines the pattern.

"While environment may prevent the child from developing this predetermined pattern, orthodontic treatment (correction of irregularities of the teeth) cannot exceed it, in fact, it probably can only approach it."

The least possible treatment should be given to effect desired changes, he said.

If an appliance is to be used to correct irregularities, it should be of the type which allows the teeth to function to the greatest degree according to their normal relationships.

Science News Letter, November 11, 1950

THE FIELDS

GENETICS

Contact with One Polio Virus Common for Child

➤ GETTING infected with one of the three known strains of polio virus, called Lansing, seems to be a common accompaniment of normal childhood development, Dr. Thomas B. Turner of Johns Hopkins University told members of the American Public Health Association meeting in St. Louis.

The child comes in contact with this particular polio virus about as often as he comes in contact with other childhood diseases.

These are among the findings of a study of almost a thousand residents of Baltimore, about 90% of them children under 15 years, made by Dr. Turner and the following associates: David H. Hollander, Sonia Buckley, U Pentti Kokko and Dr. Charles P. Winsor. The study was started in 1941, interrupted by the war and resumed late in 1946.

The findings are based on blood tests showing presence or absence of antibodies to the Lansing polio virus. At least two other types of polio virus exist, and there is some evidence to indicate that the Lansing type accounts for only a small fraction of the polio infection that shows up as sickness.

With rare exceptions, the Hopkins scientists found, the process of acquiring naturally antibodies to Lansing polio during childhood was free of symptoms of sickness. Once acquired, the antibodies tended to last for an indefinite time. This might be due to the booster effects of repeated contacts with the virus.

Most babies have Lansing strain antibodies which they get from the mother's body before birth. The antibodies are lost in about 90% of children within one year of birth. Then they start acquiring them again.

Lansing virus infection, the scientists reported, is influenced by seasonal factors. It comes to a sharp peak in late summer and early fall, whether it shows up as sickness or not. The reason for this seasonal distribution, however, is not known.

Science News Letter, November 11, 1950

MEDICINE

Fuzzy Mice Bred For First Time

➤ A STRAIN of fuzzy mice has been bred and established for the first time at the Roscoe B. Jackson Memorial Laboratory in Bar Harbor, Me.

The importance of the "Fuzzy" mutation is explained by Miss Margaret M. Dickie, research associate of the Laboratory, as

follows: For the first time all four types of hair common to normal coats and other curly coated animals do not occur in the fuzzy mouse's coat. Only zigzag hairs or derivations of these are present.

The fuzzy mice have soft, sparse hair not unlike the down of a newly hatched chick, Miss Dickie and Dr. George W. Woolley, formerly with the Laboratory and now at Sloan-Kettering Institute, New York, say in their description of the new mice in their report to the JOURNAL OF HEREDITY (July).

The new mice join the waved, Caracul, Rex, "naked," bald and rhinoceros breeds of mice at this famous genetics and cancer research laboratory.

Science News Letter, November 11, 1950

MEDICINE

Cortisone in Action Seen Through Rabbit Ear Window

➤ THE ACTION of cortisone, famous anti-arthritis chemical, on another ailment, serum sickness, can be seen through a rabbit ear window, Drs Robert H. Ebert and Robert W. Wissler of the University of Chicago reported to the Central Society for Clinical Research in Chicago.

The rabbit ear window, or chamber, is a transparent, two-piece plastic device about the size of a half dollar. It clips over a rabbit's ear, letting doctors see through the thin tissues, with skin cut away. The rabbit is neither harmed nor hampered by the device which gives the scientists a view of minute changes as they occur in disease.

Serum sickness sometimes afflicts humans as a result of proteins in serums used in immunizing "shots" for disease prevention. Through the rabbit ear window, scientists could see changes when this condition occurred in rabbits. White blood cells stuck to the sides of the tiny blood vessels. The cells lining the blood vessels swelled. Sometimes blood clots plugged the vessels.

In rabbits treated with cortisone, these damaging reactions were remarkably reduced.

Science News Letter, November 11, 1950

DENTISTRY

False Teeth Get Loose When You Lose Weight

➤ STORE teeth, like clothes, lose their fit if the wearer gains or loses weight, Comdr. Frank Myers Kyes of the U. S. Naval Dental School, Bethesda, Md., pointed out at the meeting of the American Dental Association in Atlantic City.

"When a patient loses 15 pounds of weight, he is not surprised to notice his trousers do not fit," Comdr. Kyes said. "Generally, his dentist has to tell him that his dentures will be affected similarly."

Science News Letter, November 11, 1950

AERONAUTICS

Plane Distress Signals At Flip of Switch

➤ A FLIP of a switch by the pilot of an airplane in distress will automatically turn the craft's radio transmitter to sending out a series of SOS's and radio signals in a device developed in Dayton, Ohio, at the Wright-Patterson Air Force Base.

It is a time-saver and maybe a life-saver. With it, when a pilot realizes that his plane is in danger, no time is lost making radio contact with the ground and he can devote his entire energy to making a crash or forced landing. The radio signals automatically sent when the switch is flipped will aid ground direction equipment to locate the plane.

Designed for use with any present standard airborne communication transmitter, the keyer is slated for installation in most aircraft of the Air Force.

Science News Letter, November 11, 1950

New Drug Fights Ringworm And Athlete's Foot

➤ A NEW chemical remedy which is reported to give "quite impressive results" in treating ringworm of the scalp in children, athlete's foot and other fungus infections of the skin, was announced at a meeting of the New York Academy of Sciences in New York.

The new drug is called "Asterol" It belongs to the class of chemicals called benzothiazoles. The general anti-fungus power of these chemicals led Dr. Norbert Steiger of the Hoffmann-La Roche Company, Nutley, N. J., to put together the compound called Asterol for short. Chemically, it is 2-dimethylamino-6-B-diethylaminoethoxybenzothiazole.

Although possessing quite high anti-fungus activity, the new chemical has a low toxicity and is entirely without skin-irritating effect, tests have shown.

Results of use of Asterol for ringworm of the scalp in children and athlete's foot were reported by Dr. Frederick Reiss of New York University-Bellevue Medical Center, New York, and Dr. Conrad Stritzler and associates of Queens General Hospital, Jamaica, N. Y.

Asterol will not be available for commercial sale until the early spring of 1951 because of the need for additional manufacturing facilities.

The team of Hoffmann-La Roche which reported to the membership of the New York Academy of Sciences on the new ringworm and athlete's foot drug treatment consisted of Drs. E. Grunberg, G. Soo-Hoo, E. Tittsworth, D. Ressetar and R. J. Schnitzer. Dr. Grunberg described the laboratory studies leading to the discovery of Asterol.

Science News Letter, November 11, 1950

GENERAL SCIENCE

Search for Scientists

Student scientists who will be discovered in the Tenth Annual Science Talent Search will lead in the pioneering of unknown fields, vital to both war and peace.

By MARGARET E. PATTERSON

➤ YOU expect America to keep its place of world leadership in war and peace.

You count on America's scientists to develop better drugs, fuels, weapons, communications and all those things which make America what it is. Scientifically-trained replacements must be added from the youth of the country.

Can you recognize a young scientist when you see one?

If you can, you can help in a nation-wide search for the high school seniors of the Class of 1951 who have the greatest promise of research ability in science.

College scholarships, amounting to \$11,000, await the 40 boys and girls who win in the Tenth Annual Science Talent Search. Each will attend the five-day Science Talent Institute in Washington, D. C., next spring with all expenses paid. Honorable mention will be given to 260 more.

Criterion for Scientist

How can you recognize a young scientist when you see one? Use this check list:

1. A well-developed sense of curiosity about almost everything.
2. A willingness to work—hard.
3. Persistence in the face of discouragement.
4. Above average scholastic ability with grades to prove educational opportunities have not been slighted.
5. An acquaintance with science, compounded of reading, talking with others and actual experimentation.
6. Likes to build things and make them work, or takes things apart to see how they work.
7. Reads about science voraciously, and usually enjoys mathematics.
8. Collects such things as stamps, butterflies, minerals, etc.
9. Becomes so absorbed in projects he occasionally forgets to eat, sleep or keep appointments.
10. Relaxes with music and plays games like chess.

If a high school senior you know fits some or all of these characteristics, urge that youngster to enter the 1951 Science Talent Search.

About 16,000 other high school seniors will take a three-hour science aptitude examination in their own schools, submit scholastic and personal recommendations from teachers and principals and write 1000-word reports on their individual scientific projects.

In 1951—as for the past nine years—40 winners will be named and invited to Washington, D. C., to compete for the Westinghouse Science Scholarships. A total of 260 more will be named for honorable mention. All will be recommended for scholarships to the colleges, universities and technical schools of their own choice.

The Science Talent Search, conducted annually by Science Clubs of America, is made financially possible by the Westinghouse Educational Foundation of the Westinghouse Electric Corporation as a contribution to American science.

Winners of Past

Years have gone by since 9 girls and 31 boys were chosen as winners in the first Science Talent Search in 1942.

What kind of scientists have they become? Among the 40 today there are nine chemists, eight physicians, five physicists and five chemical engineers. Three each are mechanical and electrical engineers, two are biochemists and one each is an astronomer, mathematician, physiologist, psychologist and political scientist.

The top winners, who received Westinghouse Grand Science Scholarships of \$2,400 each in 1942 are good examples of the progress of the group.

Dr. Marina Prajmovsky Meyers of Farmingdale, N. Y., is a Radcliffe graduate who spent a year doing research in neurophysiology at Harvard. She and her husband, recent graduates of Yale Medical School, are now interning at Wayne County General Hospital in Eloise, Mich. Dr. Meyers plans to specialize in diseases and conditions of the eye.

Dr. Paul Erhard Teschan of Shorewood, Wis., has four degrees from the University of Minnesota. He interned and spent a year's residency in Chicago. With his wife, also an MD, and a son, he now lives in Washington, D. C., where he is a member of the research staff of Walter Reed Hospital. His chosen career is research and teaching in internal medicine.

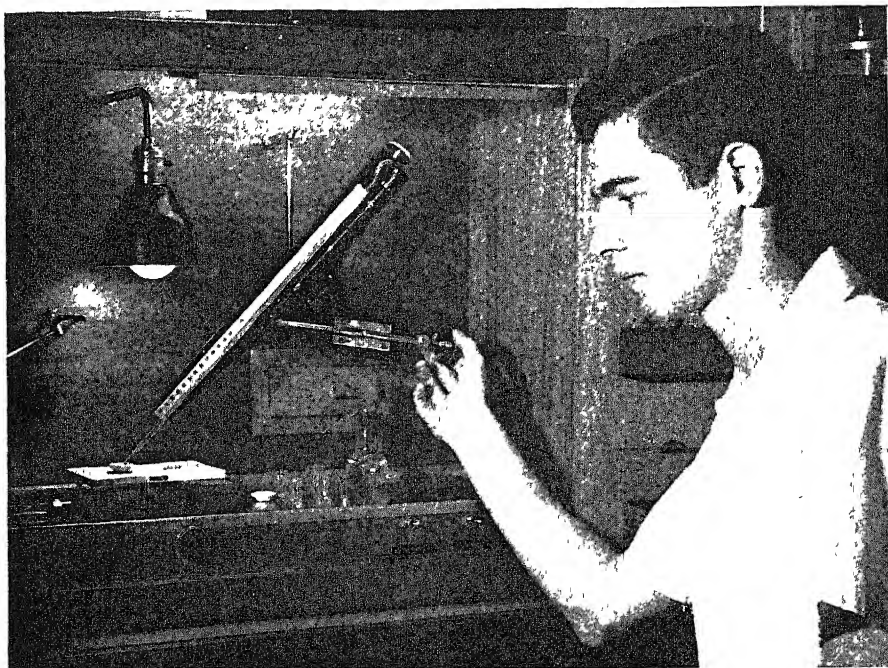
The 40 winners would modestly tell you they are just getting far enough along in their training to begin contributing to science. But look into some of their laboratories to see what they are doing:

Biochemist Dr. Evelyn Pease Tyner (Boonville, Ind.) is at the University of Michigan investigating amino acids, those building blocks of protein so necessary to nutrition.

Physiologist Paul Cranefield, Jr. (Colum-



GENETICIST—Barbara Wolff, 20, of Flushing, New York, a top STS winner in 1948, worked with mice at Jackson Memorial Laboratory in Bar Harbor, Maine, during the summer. In the winter she studies genetics at Swarthmore College under a \$2,400 scholarship.



CHEMIST—A winner in 1946, Walter G. Gall, 21, of Garfield, N. J., has collected since that time a master's degree from Carnegie Tech, and is beginning his doctorate in organic chemistry at the University of Rochester. Here he operates micropipette equipment at the Army Chemical Center in Maryland last summer.

bus, Wis.) is trying to solve the secrets of epilepsy, by his work at the University of Wisconsin

Organic chemist Seymour Linder (N.Y.C.) already has several new drugs and pharmaceuticals to his credit in his position as research chemist at Hoffmann-La Roche, Inc, Nutley N. J.

Organic chemist Dr. Wolf Karo (Utica, N. Y.) spends his working hours devising better and faster fuels for jet planes with the National Advisory Committee for Aeronautics in Cleveland, Ohio

Psychologist Beatrice Meadowitz (N.Y.C.), now completing her PhD at the University of Rochester, is studying possible solutions of problems which beset minority groups

Electrical engineer Paul Winsor III (North Cohasset, Mass.) designs compli-

cated electronic circuits which make it possible for speedy calculating machines to solve problems once prohibitive in man-hours of time. He is employed by Eckert-Mauchly Computer Corp. in Philadelphia.

Physicist Clifford Swartz (Niagara Falls, N. Y.) assists in the construction of a cyclotron at the University of Rochester while he completes his doctorate.

Physicist Donald White (Schenectady, N. Y.) is studying for his PhD in fluid dynamics at Princeton. His work on the diffraction of shock waves is of great importance to the armed forces. Both White and Swartz have sizable fellowships to support themselves and their families.

No less important is the work of the other winning groups of 40 over the past nine years, whether they are now only college freshmen serving their apprenticeship as

laboratory "bottle washers" or advanced to positions like Dr. Robert Kraichnan, Philadelphia, Pa.) a winner in 1944, whose study at the Institute for Advanced Study in Princeton, N. J., is directed by Dr. Albert Einstein.

Important, too, are the contributions being made by the more than 2,000 named as honorable mentions since 1942 and hundreds more who have been able to further their education in science through the efforts of cooperating scientists administering concurrent State Science Talent Searches in 23 states.

It is to keep a steady stream of able and creative minds channelled into this reservoir of science talent that the Science Talent Search operates.

No resource in our land is more important and as necessary to conserve as the inventive and ingenious spark that makes a boy or girl a research scientist.

Look around—wherever you are. Find your young scientists and see that they enter the Tenth Annual Science Talent Search.

Their future may depend on your ability to recognize their potentialities

The future of all of us may depend on the detection and training of their talent

Complete details of the Tenth Annual Science Talent Search may be obtained by writing to Science Clubs of America, 1719 N St. N. W., Washington 6, D. C.

Science News Letter, November 11, 1950

INVENTION

Typewriter Makes Sheet Music Symbols

➤ IT will be easy to write musical notes on any desired line or space of a printed staff with a special typewriter on which Carroll E. Brizendine, Burbank, Calif., received patent 2,528,110. Keys are provided to print all the customary symbols employed in sheet music.

A special feature of the machine is that musical notes can be printed where wanted without rotation of the platen. Included is a device by which musically lined paper may be aligned selectively in position for impression of notes corresponding either to bass or treble staff.

Science News Letter, November 11, 1950

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ARCHAEOLOGY

Most Delicate Flint Work

► MORE than 1,500 tiny, delicate flint objects, unearthed on Cape Denbigh overlooking Norton Bay, most northwesterly extension of Bering Sea, were the work of a Stone-Age people who lived there thousands of years ago. The find was made by Dr. J. L. Giddings, Jr., of the University of Alaska, and was reported in New York to the New York Academy of Sciences.

These delicately worked objects are the "most meticulous work in flint" known, Dr. Giddings said. One thin stone blade, less than an inch and a quarter long (smaller than a paper clip), is worked with more than 20 parallel, diagonal scars on each face. Of the 1,500 objects, there is not a single large stone tool—no hammer, no adze, no grinding slab. Eskimo guides of the expedition believe the objects must have been the work of a race of "little people" who lived there in ages past.

The tiny objects have little or no simi-

larity to the work of Eskimos of the region, Dr. Giddings said. They do, however, resemble the work of Stone Age Man in the Old World. Some of the points are very much like the famous Folsom and Yuma points, work of the oldest inhabitants of America's Southwest.

At the surface of the site where these ancient objects were unearthed, Dr. Giddings found a thick layer of sod and bunch grass. Few cultural remains were found in this layer. But directly below it he found polished slate and other objects of a people Dr. Giddings calls the Neo-Eskimo. The Neo-Eskimos lived there for several centuries and disappeared about 300 years ago.

Below this layer and separated from it in some parts by sod, he found a bed of fine-grained loam containing stone lamps and flaked stone tools of basalt which were the work of the earliest known Eskimo people, called the Palae-Eskimo.

Digging deeper, Dr. Giddings found a layer of sandy silt seven feet deep. In this silt, no sign of human occupation whatever was found.

Under the silt was bedrock coated with

a pencil-thin layer of clay. On the surface of this thin clay layer is where Dr. Giddings found the tiny flint tools made by such skilled workmen thousands of years ago.

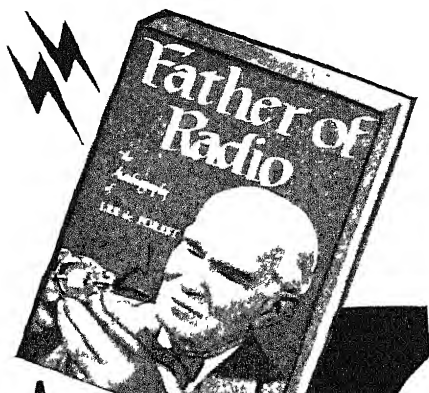
Examination of the geology of the site shows, Dr. Giddings reported, that the little flint tools were dropped there in a long-ago day when Alaska was permanently frozen and had a climate more like that of the glacial age than that of the present. Since then there has been a warmer period and a second cold period before the relatively stable climatic conditions marking the appearance of Eskimo cultures.

Folds in the clay layer form a "solifluction lobe" formed by the thawing of a fine-grained soil below an elastic sod cover and above the hard-frozen permafrost. The Denbigh flints were already there when these solifluction lobes were forming.

The digging by Dr. Giddings this past summer was under the auspices of a joint "Bering Straits Expedition" of the University of Pennsylvania Museum, the Danish National Museum and the University of Alaska with a Viking Fund grant.

Dr. Giddings has brought back materials suitable for dating on the radioactive carbon calendar and has submitted them for dating by this means. These people are much more ancient than the Palae-Eskimos, who are not older than 1,000 years as dated by the radiocarbon calendar.

Science News Letter, November 11, 1950



Autobiography of LEE de FOREST Father of Radio

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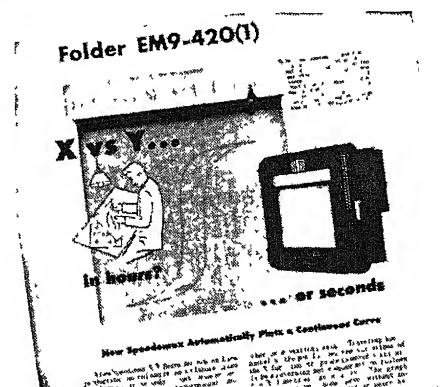
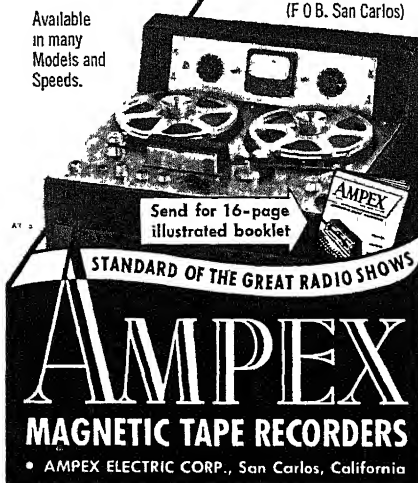
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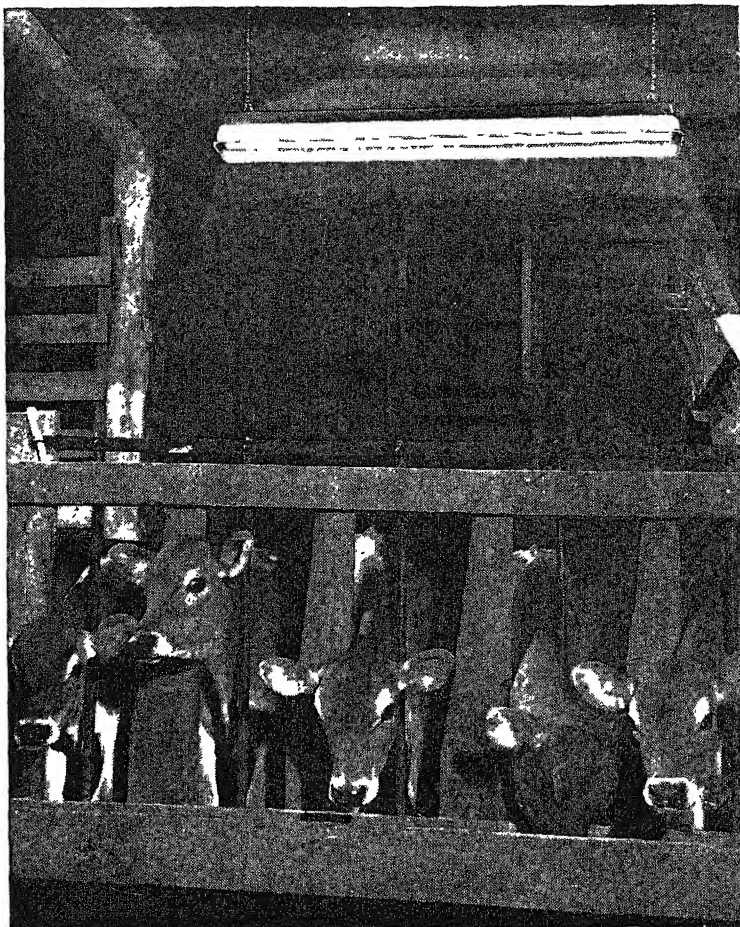
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*A product of the Lamp Division, Westinghouse Electric Corp., Bloomfield, N. J.

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In a test case still under way, the increase in

egg production that has taken place was enough to pay for the sun lamp equipment in approximately three months.

While benefits obtained by calves, hogs and other farm animals have not all been determined, it is believed from experience so far that results will lead to extensive application of this lamp as a farm productive tool.

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Kangaroo Rat

➤ THE NORWAY rat has done a disservice to the rodents of the world by making himself an impudent nuisance and even sometimes a menace to health and human life. For he has brought into disrepute a host of respectable and even attractive rodents who share the name "rat."

There are, for example, the kangaroo rats. The method of locomotion distinguished by leaping great distances on the hind feet is ordinarily thought to be the

province of frogs, grasshoppers and certain Australian marsupials who carry sidecars in front for their young. But as a matter of fact, there are many animals of other families elsewhere in the world who have discovered for themselves that jumping is the best defense. When danger threatens the one good way to escape is simply to leave—preferably by air, as far and as fast as muscles will allow.

That is what the kangaroo rat does. Unlike his larger namesake, who goes leaping across the countryside as an every-day sport, this little animal normally sticks close to terra firma and does not jump about in hops many times his own body length. But when he doesn't like the sound or smell of his environs, he can take off like a startled grasshopper, and no dog or snake can predict in which direction or how far he will jump.

The kangaroo rat is like the larger kangaroo in that he uses his tail as a support, the third member of a three-cornered tri-

pod on which he sits and surveys the world. His muscular tail has a bit of window-dressing, in addition. It ends in a bushy tuft of hair which flies out behind its owner whenever he jumps, like a foxtail on a hopped-up hot rod.

There are several species of kangaroo rats in America, all of them outdoor dwellers. You have no need to fear that some day a household mouse will begin leaping about your furniture. Although there are a number of smaller jumping rodents as well as the rats, these too stick to wide-open fields and woodland. Their common name is "Kangaroo mice," obviously.

To balance this borrowing of another animal's title, there are in Australia certain kangaroo-like creatures which are so small that they are usually called "mouse-kangaroos." Where one family stops and the other starts is a nice question. It can best be left to the jumping frog of Calaveras County to decide.

Science News Letter, November 11, 1950

• Books of the Week •

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THE ADVANCEMENT OF SCIENCE—*British Association for the Advancement of Science*, 170 p., illus., paper, 6 shillings. Mostly addresses presented at the Birmingham meeting, 1950.

THE ANATOMY OF THE GORILLA: The Studies of Henry Cushman Raven and contributions by others—William King Gregory, Ed.—*Columbia University Press*, 259 p., illus., \$15.00. A detailed anatomical description of the great anthropoid ape. Excellent illustrations.

ANNUAL REPORT OF THE SECRETARY OF THE INTERIOR—*Gov't Printing Office*, 407 p., illus., paper, 75 cents. Achievements of the department for the past year ending June 1949.

AN ANTHROPOLOGICAL BIBLIOGRAPHY OF THE EASTERN SEABOARD—Irving Rouse and John M. Goggin, Eds.—*Eastern States Archeological Federation*, 174 p., paper, \$2.50.

ARTHRITIS AND THE MIRACLE DRUGS—Alton L. Blakeslee—*Public Affairs Committee*, Pamphlet No. 166, 32 p., illus., paper, 20 cents. A pamphlet telling the effects of cortisone and ACTH on arthritis.

CHEMISTRY AND BIOLOGY OF PROTEINS—Felix Haurowitz—*Academic Press*, 374 p., illus., \$5.50. A textbook for graduate students.

THE CLIMATE NEAR THE GROUND—Rudolf Geiger—*Harvard University Press*, 2nd ed., 482 p., illus., \$5.00. An earlier work brought up-to-date. Translated from the German by Milroy N. Stewart and others.

DE RE METALLICA—Georgius Agricola—*Dover*, 638 p., illus., \$10.00. A new edition of a scientific classic which was translated in a limited edition in 1912. Translated from the first Latin edition of 1556 with biographical introductions, annotations and appendices upon the development of mining methods, metallurgical processes, geology, mineralogy and mining law from the earliest times to

the 16th century. Translated by Herbert Clark Hoover and Lou Henry Hoover.

EMOTIONS AND CLINICAL MEDICINE—Stanley Cobb—*Notton*, 243 p., illus., \$3.00. A review of the field. Material is drawn chiefly from the author's three Salmon Lectures in November, 1949.

EQUILIBRIUM DATA FOR TIN ALLOYS—*Tin Research Institute*, 60 p., illus., paper, 50 cents. Intended as a reference book for metallurgists and scientific workers.

FEELINGS AND EMOTIONS: The Mooseheart Symposium in Cooperation With The University of Chicago—Martin L. Reymert, Ed.—*McGraw-Hill*, 603 p., illus., \$6.50. Theoretical and experimental contributions to the psychology of feelings and emotions as presented at the symposium in 1948. Among the contributors are Gardner Murphy, Margaret Mead, Arnold Gesell and Curt P. Richter.

THE FLIGHT OF THUNDERBOLTS—B. F. J. Schotland—*Oxford University Press*, 152 p., illus., \$3.00. A book on lightning for both the general reader and the specialist.

THE FIRST BOOK OF INDIANS—Benjamin Brewster—*Watts*, 69 p., illus., \$1.50. A child's book telling how the Indians lived before the white man came and how they live now. Well illustrated by Ursula Koering.

FOREST PLANTATIONS IN THE LAKE STATES—Paul O. Rudolf—*Gov't. Printing Office*, 171 p., illus., paper, 45 cents. Reviews the many forest projects taking place in the lake states.

GEOGRAPHICAL VARIATION AND SUBSPECIATION IN *HELICONIUS CHARITONIUS* LINNAEUS (LEPIDOPTERA, NYMPHALIDAE)—William P. Comstock and F. Martin Brown—*American Museum of Natural History*, 21 p., illus., paper, 25 cents.

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Force—Gov't Printing Office, Vol. I 648 p., illus.; Vol. II. 651 p., illus., Set \$8.50. A report of a special team of experts from the U. S. Air Forces who visited nearly every university, laboratory and military installation where medical research in support of the Luftwaffe was carried out.

HEALTH INSTRUCTION YEARBOOK 1950—Oliver E. Byrd, Compiler—Stanford University Press, 270 p., illus., \$3.50. Presents findings of the latest research during the past year.

HOW TO DEVELOP YOUR THINKING ABILITY—Kenneth S. Keyes, Jr.—McGraw-Hill, 246 p., illus., \$3.50. Some practical ideas on how to develop clear thinking. 81 cartoons illustrate these ideas.

MATHEMATICS TO USE—Mary A. Potter and others—Ginn, 501 p., illus., \$2.40. A junior-high school text.

THE MINERAL INDUSTRIES OF NEW YORK STATE Department of Commerce—Division of Commerce and Industry, State of New York, 108 p., illus., paper, free upon request to publisher, 112 State St., Albany 7, N. Y.

REPTILES AND AMPHIBIANS OF THE NORTHEASTERN STATES—Roger Conant—Zoological Society of Philadelphia, 40 p., illus., paper, \$1.00 (Plus 10 cents for postage). A non-technical resume of the snakes, lizards, turtles, frogs, toads and salamanders of the area.

A REVISION OF THE GEOMETRID GENUS *SERICOSEMA* (LEPIDOPTERA)—Frederick H. Rindge—American Museum of Natural History, 30 p., illus., paper, 25 cents.

A REVISION OF THE NORTH AMERICAN SPECIES OF THE GENUS *SYRRHODIA* (LEPIDOPTERA, GEOMETRIDAE)—Frederick H. Rindge—American Museum of Natural History, 26 p., illus., paper, 25 cents.

THE SOLUBILITY OF NONELECTROLYTES—Joel H. Hildebrand and Robert L. Scott—Reinhold, 3rd ed., 488 p., illus., \$10.00. An advanced college text brought up-to-date.

THE SOUTH AMERICAN HANDBOOK 1950: A Year Book and Guide to the Countries and Resources of South and Central America, Mexico and Cuba—Howell Davies, Ed.—Trade and Travel Publications (U. S. Distributor; H. W. Wilson), 27th annual edition, 766 p., illus., \$1.50.

SURVIVAL UNDER ATOMIC ATTACK—National Security Resources Board—Gov't. Printing Office, 31 p., paper, 10 cents. Practical suggestions for protection against an atomic attack.

THEORY OF MENTAL TESTS—Harold Gulliksen—

Wiley, 486 p., illus., \$6.00. Material included is based on the author's experience at the University of Chicago and Princeton. Written primarily for those working in test development.

TAXONOMIC KEYS To the Common Animals of the North Central States Exclusive of the Parasitic Worms, Insects and Birds—Samuel Eddy and A. C. Hodson—Burgess, 123 p., illus., paper, \$2.00.

UNDERPINNING: Its Practice and Applications—Edmund Astley Prentiss and Lazarus White—Columbia University Press, 2nd ed., 374 p., illus., \$10.00. A technical description of methods and applications for foundation construction.

WOOD PRESERVATION STATISTICS 1949—Henry B. Steer—Forest Service, U. S. Dept. of Ag., 31 p., illus., paper, free upon request to publisher, Washington 25, D. C.

Science News Letter, November 11, 1950

GENERAL SCIENCE

Work of Gibbs, Long Acclaimed in Europe

► THE GENIUS of Josiah Willard Gibbs, American scientist named with two U. S. presidents as one of six new names in New York University's Hall of Fame, has long been acclaimed in Europe.

But Gibbs' name is almost unknown to his countrymen, and even scientists did not recognize his greatness until years after his death.

Henry Adams called this mathematical physicist "the greatest of Americans, judged by his rank in science." Modern chemistry and metallurgy is based upon his discoveries in the laws of heat. He was a professor at Yale University from 1871 until his death in 1903. Yet it was Maxwell, a great Scottish physicist, and later the most learned scientific societies of Europe, who first realized his stature.

Today, nearly 50 years after his death, Gibbs is recognized as having revolutionized chemistry. His principles opened the way for the iron and steel of this century, porcelain, cement, synthetic nitrate fertilizers and hundreds of other vital applications of science to modern industry.

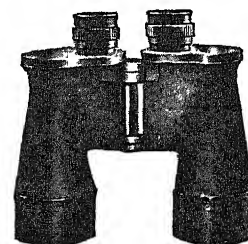
Science News Letter, November 11, 1950

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full year against any defects in workmanship or materials. Sold with 10 DAY MONEY BACK PRIVILEGE. Stock #963-Q.....0x30.....\$75.00 Postpaid. Stock #964-Q.....7x35.....\$85.00 Postpaid. Stock #965-Q.....7x50.....\$95.00 Postpaid. Stock #966-Q.....9x50.....\$95.00 Postpaid. (Be sure to add 20% Fed. Tax.)

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• New Machines and Gadgets •

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❄️ **PLASTIC SNOWFLAKES**, made of transparent styrene, provide sparkling Christmas decorations with a gem-like appearance. They are giant snowflakes in size, and can be bought in individual form or assembled to form an 18-inch Christmas tree or a Gothic window.

Science News Letter, November 11, 1950

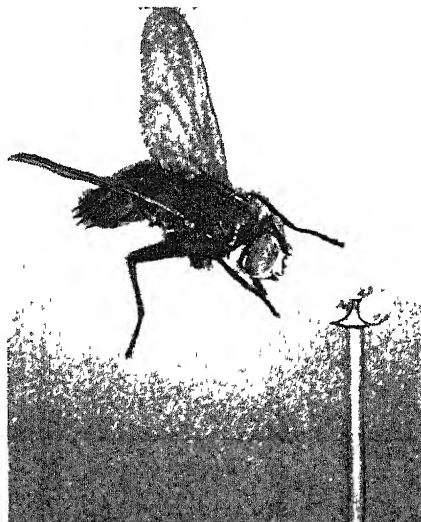
❄️ **MULTI-COLOR ENAMEL**, for uses ranging from furniture to sidewalls is applied in a single coat to give a uniformly-distributed broken-effect finish. A combination of brown-and-white, or black-and-white, gives a marbleized finish. The enamel is available in 16 color combinations.

Science News Letter, November 11, 1950

❄️ **INFRARED HEATER**, in a 10-inch deep aluminum cup, is controlled by an automatic thermostat which turns on the electric current and heat when the temperature approaches freezing. The portable device has many applications from engine warming to frost protection.

Science News Letter, November 11, 1950

❄️ **TINY OBJECTIVE LENSES** used in certain microscopes are smaller than a housefly's eye but accurate to a millionth of an inch. Three of them, among the most



powerful lenses known, are shown in the picture on the head of a common pin

Science News Letter, November 11, 1950

❄️ **LABORATORY MIXER** for liquids, a liquid and a solid, or a liquid and a gas, does not use the customary whirlpool action but instead a paddle-baffle arrangement

which mixes both horizontally and vertically. It is faster and more efficient than whirlpool mixing.

Science News Letter, November 11, 1950

❄️ **POLISHING BLOCK** for silverware is made of a chemical rubber known as neoprene with contours that fit silver of different shapes. The top has grooves for forks, a flat section for knives, and spoon-fitting parts. Silver polish is applied directly to the neoprene block.

Science News Letter, November 11, 1950

❄️ **BLANK FACE** of a new type of doll can be changed with pencil or crayon as often as the young owner may wish. The face is made of rigid vinylite plastic on which new expressions can be easily drawn, and from which old decorations can be wiped with tissue.

Science News Letter, November 11, 1950

❄️ **OZONATOR** in a new type is an industrial machine for testing rubber and rubber-like materials in an atmosphere containing ozone. The machine generates ozone into an exposure chamber on which specimens are rotated on a rack. Resistance to cracking is tested.

Science News Letter, November 11, 1950

Do You Know?

South Korea has one of the world's largest deposits of *tungsten*.

Sweet potatoes are rich in *carotene* which, in the body, changes to vitamin A.

Cypress wood usually contains an oily material that forms a natural preservative.

The growing use of paper *handkerchiefs* is said by scientists to be an important factor in the control of infectious diseases.

Klystron is a new kind of radio tube which makes it possible to transmit telephone conversations long distances without wires.

Colombia is the only principal livestock-producing country in South America entirely free from the destructive hoof-and-mouth cattle disease.

Glauber's salt is being used in a Massachusetts experimental house to store solar heat until needed to heat the house; the heat of the sun liquefies it, but the heat is given off when the salt solidifies later.

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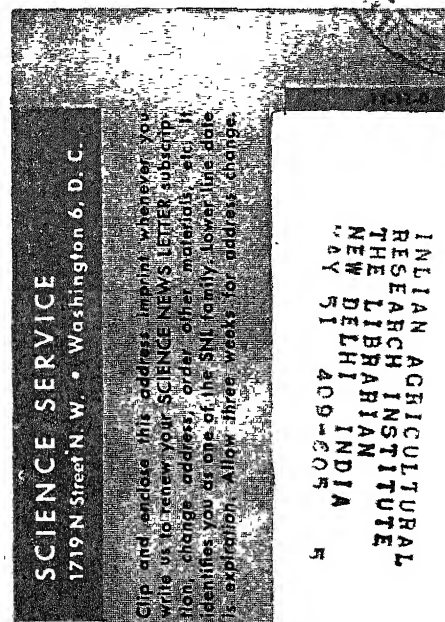
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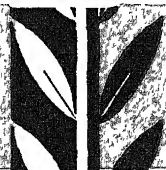
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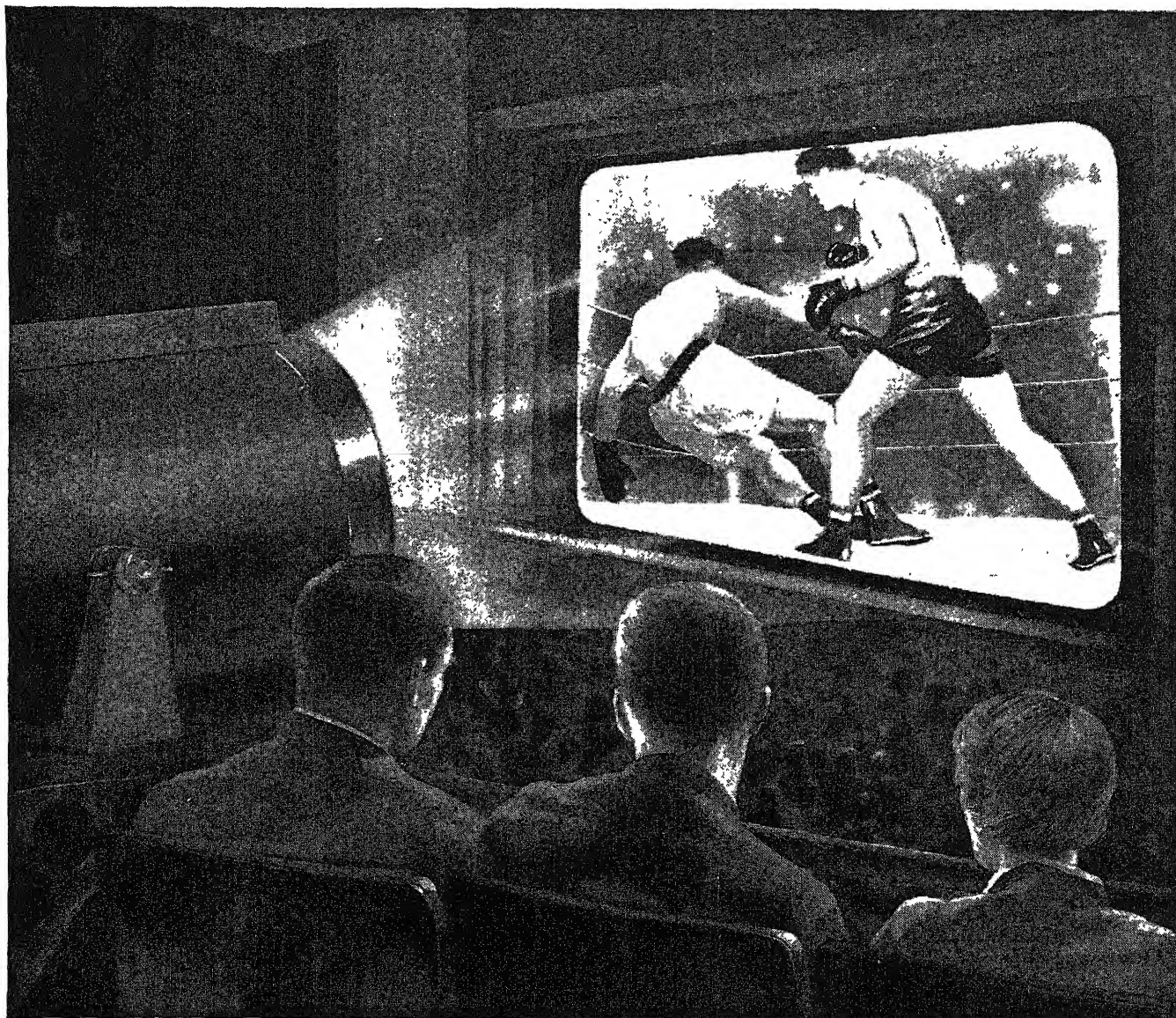
Majestic Graveyard

See Page 328

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New RCA Theatre Television System projects 15 x 20 foot pictures of television programs.

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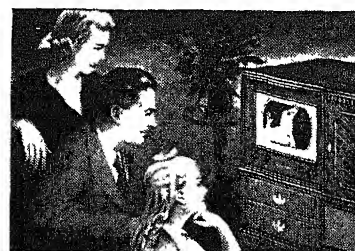
Success of the system comes from a remarkable RCA kinescope, and something new in projection lenses. The kinescope, developed at RCA Laboratories, is in principle the same as the one on which you see regular telecasts. But it is *small*—only a few inches in diameter—and produces images

of high brilliance. These are magnified to 15x20 feet by a "Schmidt-type" lens system like those used in the finest astronomical telescopes.

Because of its size and shape, the new projector is referred to by engineers as the "barrel." It's already going into theatres, where you'll be seeing giant television—shot from a barrel.

* * *

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MEDICINE

Life Saving Drugs

Many lives of soldiers may be preserved by new anti-blood clotting drugs in case of wounds, heart disease or frostbite. One to be taken by mouth foreseen.

➤ ANTI-BLOOD clotting drugs may save the lives of many of our fighting men threatened by fatal blood clots after wounds or in case of heart disease, Dr. Irving S. Wright of Cornell University Medical College declared at the meeting of the Association of Military Surgeons in New York.

In the future, soldiers may also be protected against loss of a foot or other part through frostbite. This will depend on development of an anti-clot drug which can be taken by mouth and will produce its effect within an hour. Such a drug is "not at all unlikely in the light of recent developments," Dr. Wright declared.

Drugs now used to treat conditions in which blood clots threaten to or actually do obstruct blood vessels are heparin, dicumarol and Tromexan. Other new ones, now under study, are BL-5, phenylindanedione and Paritol.

Accidental injuries in combat training programs as well as war wounds and operations are likely to increase the occurrence of thrombophlebitis, the blood-clot-in-the-veins condition, Dr. Wright pointed out.

The soldier who is not treated with suitable anti-blood clot drug when he develops this condition in the saphenous veins in the leg has a 30% to 50% chance of suffering a clot on the lungs, Dr. Wright reported. After this, he has a 20% chance of having a fatal clot.

With correct anti-clotting treatment, the risk of the first clot on the lungs is reduced to five percent and the risk of death five-tenths percent.

Among the most common operations required by war, Dr. Wright pointed out, is the repair of connections between an artery and a vein brought on by a penetrating wound. The variety of these is infinite as to type and location and often taxes the ingenuity of the most skillful surgeon. To get best results in such cases, a team trained in the use of the anti-clotting drugs should follow the patient through his operation and after.

Men in military service are also liable to heart disease, Dr. Wright stated. Thousands developed rheumatic heart disease in World War II. Many of these have or will develop the serious condition called auricular fibrillation and some will develop clots.

The use of anti-clotting drugs, notably long-time treatment with dicumarol, will prevent, in almost every case of fibrillation, the formation of clots within the heart and their release as emboli that are carried on to obstruct blood vessels elsewhere in the body.

This, Dr. Wright declared, is the only

form of treatment which will attack this problem with any degree of success.

As proof he cited a series of more than 100 patients treated with dicumarol while up and about for from one to five years, a total of over 400 patient years. "Notable success without a single death from hemorrhage" has been obtained with this group. This type of treatment, however, must be carried out only when it is carefully controlled, he warned.

More than 800 soldiers under 40 years old died of the serious heart condition called coronary thrombosis with myocardial infarction during World War II, Dr. Wright reported. The total of all ages who developed this condition would run into many thousands.

The death rate from this condition can be reduced one-third by the use of anti-clotting drugs.

Science News Letter, November 18, 1950

PHYSICS

Everything Is Going Up; Even Speed of Light

➤ BETTER AIMING of ship's guns by radar is expected to result from the use of a new value for the speed of light announced in Stanford, Calif.

The new value, 299,789.3 kilometers per second, (approximately 186,280 miles per second) is about 13 kilometers per second faster than the generally accepted figure. Stanford claims a possible error, plus or minus, of only four-tenths of a kilometer per second. This claimed error is much smaller than the differences in the various values for the speed of light found by other investigators.

The recently announced value is spurring scientists to further experiments to set this fundamental unit with a margin of error that leaves no room for doubt within practical limits as to the correct figure.

Many measurements of the velocity of light using visible light have been made, each investigator generally claiming a high degree of accuracy. The differences between the results obtained, however, far exceed the limits of accuracy set by the experimenters. Reconciliation of these various determinations is a matter of great concern to physicists.

Radar uses the time taken by radio waves to travel to an object and back to determine its distance. Radio waves differ from light waves only in their wave length and it is assumed that both travel at the same speed.

Recently scientists have measured radio

waves, instead of light waves, to find the velocity of light. Dr. Kees Bol and William J. Barclay, under the supervision of Dr. Edward Ginzton, all of Stanford University here, did the major part of the research work leading to the announcement.

Their results are in very close agreement with the recently reported value of 299,792.5 kilometers per second announced by Drs. L. Essen and A. C. Gordon-Smith of Britain's National Physical Laboratory. Possible error in this figure is, they claim, plus or minus three kilometers per second.

Both the British and American scientists obtained their values by measuring the resonant frequency of a short, cylindrical tube. A radio wave sent down this tube is reflected back and forth between the two ends. When the time of travel between the ends equals the time interval between the following waves, an electrical resonance is built up. This can be detected with very high precision.

Resonant frequency for sound can be demonstrated by holding a vibrating tuning fork over a tube of such a length that its natural pitch is the same as that of the tuning fork. This is analogous in principle to the system used for determining the new speed of light.

Science News Letter, November 18, 1950

MEDICINE

Coffee Doesn't Shorten Lifespan—in Rats

➤ IF MEN and women react like white rats, they can drink all the coffee they want without shortening their lives any. The women, in fact, might even gain a little longer life.

This is suggested by experiments reported



MEASURES LIGHT SPEED—Dr. Edward Ginzton is showing the cylinder used in Stanford University experiments to obtain a more accurate measurement of the speed of light.

by Dr. Clive M. McCay of Cornell University's animal nutrition laboratory at the conference on nutrition at Yale University.

From animal studies also comes the suggestion that powdered brewer's yeast and the pulp left from making tomato and citrus juices might help many older persons suffering from habitual constipation.

Bread, important in the diets of older people as well as children and those who carry lunches, should be made more nourishing. It should also be studied, Dr. McCay declared, with the view of helping prevent the widespread affliction of constipation.

About four percent of the calories consumed by the average American consists of alcoholic beverages, Dr. McCay reported, adding that he found it hard to believe his own figures on this.

The coffee-drinking white rats in his

laboratory lived all their lives with coffee, made fresh each day, as the only fluid they drank. Their lives were not shortened, and in one experiment the females seemed to have a "significantly lengthened" lifespan.

Rats have also been induced to drink about one-fifth of their body weight in water per day for a whole lifetime. This would be comparable to the drinking of about 15 quarts of water daily by a man. Such copious drinking neither shortened nor lengthened the life of the rats.

Old people themselves, whether living at home or in homes for the aged or mental institutions, can help scientists learn much about how they should eat, Dr. McCay said. The oldsters, he thinks, would gladly serve as human guinea pigs, because it would relieve their boredom if for no other reason.

Science News Letter, November 18, 1950

tion of Nature will be held for the first time in the Western Hemisphere on the invitation of the government of Venezuela at Caracas.

Science News Letter, November 18, 1950

Helicopter service carrying mail between the roof of a Chicago postoffice and the city's principal airport has now completed what is pronounced a successful year.

SCIENCE NEWS LETTER

VOL. 58 NOVEMBER 18, 1950 No. 21

44,300 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W., Washington 6, D. C., North 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00, 3 yrs., \$14.50, single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925, 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STAt 2-4822.

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CONSERVATION

Acts to Protect Wildlife

International Union for the Protection of Nature has just held biennial general assembly at Brussels. Union's commission will aid projects for education.

► PROTECTING birds, animals, plants and their living environment, as well as other renewable natural resources, in widely separated areas of the world is one of the prime objectives of the International Union for the Protection of Nature, whose biennial general assembly at Brussels has just been attended by leading American experts, along with delegates and observers from 34 countries.

The union's commission on conservation education to be headed by Dr. Ira N. Gabrielson, president of the Wildlife Management Institute, will aid proposed school projects for conservation education in France, Italy, India, the Belgian Congo,

and the Kingdom of Tonga in the Pacific.

Dr. Harold J. Coolidge, the U. S. vice president of the Union and executive secretary of the Pacific Science Board of the National Research Council, was a senior delegate in the American group that attended the conference. Others were Richard Westwood, president of the American Nature Association, L. A. Walford of the U. S. Fish and Wildlife Service, Victor Cahalane of the U. S. National Park Service, Cornelius Crane of Friends of the Land, H. W. Glassen of the Michigan Department of Conservation.

In 1952 the next international assembly of the International Union for the Protec-

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Photographs: Cover, George Gryn, U. S. Geological Survey; p. 323, Stanford University; p. 325, British Information Service; p. 327, Libbey-Owens-Ford.

GEOGRAPHY

Alaska Defense Discussed

Problems of this northern territory, close to Russia, engage the attention of scientists. "Permafrost" presents one of the toughest problems.

► RESEARCH for the defense of Alaska, vital strategic area only 50 miles from Russian territory, was discussed in Washington by more than 300 scientists attending the first Alaskan Science Conference, sponsored by the National Academy of Sciences

Thousand-foot Frozen Layer

"Permafrost," the underlying earth layer of the Alaskan Arctic which never thaws, is one of the toughest problems facing scientists and engineers, the conference was told

In certain localities the permanently frozen layer extends downward to at least 1,020 feet below the surface, Dr. Gerald R. MacCarthy, of the U. S. Geological Survey reported. This discovery was made in studies of oil wells drilled for the Navy in World War II. Thermal cables were lowered as far as 2,400 feet. Scientists are now ready, Dr. MacCarthy said, to sink their instruments even deeper, down to 6,000 feet into the earth

From these studies, Dr. Louis L. Ray of the Geological Survey said, will come better understanding of Alaskan vegetation and farming problems, soil, drainage, water supplies, and construction work done over permafrost—a problem vital to military defense of Alaska

Caribou Almost Extinct

Thanks to a combination of wolves and game-hungry natives armed with high-powered rifles, Alaska's "millions" of caribou no longer exist, Dorr D. Green, chief of predator control in the U. S. Fish and Wildlife Service, told the conference.

Game herds have been reduced far below any possibility of spontaneous recovery, he said, and can be maintained only by careful wildlife management methods. One of the most promising of these is wolf poisoning with baits soaked in fetid seal oil.

Wildlife Service scientists have found that valuable fur animals, such as mink, otter, marten and weasel, turn up their noses at such fare, but wolves are strongly attracted by the evil smelling bait.

Dogs Carry Worms

An embargo against any shipment of Arctic dogs to the United States was recommended by Dr. Everett L. Schiller of the U. S. Public Health Service in Anchorage. Tapeworm infections carried by dogs as well as wolves, Alaskan foxes, voles and other mammals are a serious health problem in the territory, he said.

Huskies and other sledge dogs are an apparent reservoir of tapeworms which can

cause internal tumors when transmitted to human beings.

Archaeological Sites Rifled

Serious damage to Alaskan archaeological sites is being done by Eskimos digging for ivory and U. S. soldiers and sailors hunting for curios, Prof. Frederica de Laguna, Bryn Mawr, Pa., College anthropologist, told the conference. Records of fast-vanishing native cultures are being endangered, she warned, despite a 44-year-old law providing legal protection to such sites against vandalism.

Forecast Volcanic Eruptions

The possibility that volcanic eruptions can be forecast with accuracy is being studied in Alaska, Dr. Joel H. Swartz of the U. S. Geological Survey reported. Particularly in the Aleutians, volcanos are a risk to military and civilian installations. Experiments in predicting approaching eruptions by instruments which pick up earthquake tremors are being made. Three seismic stations have already been set up on Adak and Great Sitkin Islands in the Aleutians, where measurements of "ground tilt" and magnetism are also being tested as possible eruption indicators.

Salt Varies in Ice

You cannot tell the thickness of Arctic ice by use of electrical equipment like that employed in prospecting operations. Resistivity of ice to direct current varies with the temperature of the ice and with how much salt is in the ice, William J. Dichtel and George A. Lundquist, of the U. S. Naval Ordnance Laboratory, told the scientists.

A quick method of finding ice thickness is important to many of the Armed Forces' naval and aerial operations. The two scientists said also that temperature varies with the thickness of the ice and that there is a great variation in the amount of salt in different parts of the ice.

Cortisone for Eye Ill

Cortisone, famous arthritis remedy, promises to control the major eye disease in the native populations of the Arctic circle and to prevent the blindness it causes.

Cases in which this hormone drug brought dramatic recoveries in 24 to 48 hours, instead of 10 days to three weeks or longer, were reported by Drs. Milo H. Fritz of Anchorage, Alaska, and Phillips Thygeson of San Jose, Calif., to the Alaskan Science Conference in Washington.

The eye disease is called phlyctenular keratoconjunctivitis. Little blister-like bumps

that come in crops attack the lining of the eyeball and lids and scar the cornea. Eyesight is impaired by the scars and in some cases is lost entirely.

The cause of the disease is not known. The best theory at present is that it comes from an allergy to the products of the TB germ.

While cortisone can be used to stop the acute attack of the disease and prevent scarring of the eye cornea and blindness, full control of the disease will not come until tuberculosis is eliminated.

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PHYSICS

Physics Nobel Prize For Meson Research

► PROBING the inner secrets of atoms to find out more about how they are made brought Dr. Cecil F. Powell of Bristol University the 1950 Nobel Prize in physics

Mesons are the tiny elusive particles formed when cosmic rays smash an atom to bits and in cyclotrons. Their life is short, measured in millionths of a second. They are considered key particles of the atom, perhaps holding the secret of its binding force.

For his method of photographing these nuclear processes and his discoveries about mesons, Dr. Powell received the prize.

One of the photographic emulsions that Dr. Powell developed in his laboratories contains eight times as much silver bromide as older emulsions. This aids in magnifying the path of a particle on the photographic plate. The emulsion is also loaded with boron, which prevents the tracks left by the particle from fading.

By studying meson tracks on plates exposed on mountain tops or suspended from balloons soaring miles above the earth, scientists are learning about the different types of mesons, their masses and other facts ex-



DR. CECIL F. POWELL

pected to throw much light on the nature of the atom's nucleus.

Dr. Powell was once charged by Russian scientists of ignoring their claims of discovery of new mesons. Two Russian scientists stated in a letter to *NATURE*, British scientific journal, that they had detected

16 kinds of mesons. Dr. Powell recommended that the Russians do further experiments to reduce statistical variations of the Russian observations and to give a decisive answer as to whether the many kinds of new particles they claimed really existed

Science News Letter, November 18, 1950

MEDICINE

Two Feet of Guts Enough

Body adapts to loss of most of small intestine by enlarging diameter of remnant and by colon's assuming some absorptive functions.

➤ YOU can get along pretty well nowadays with only about a foot or two of your small intestine—if disease or obstruction dictate its removal.

For one thing, improved surgery, antibiotics and blood plasma give you an excellent chance to survive an operation to remove nearly all your small intestine. As much as 15 feet of this organ now can be removed.

But how can patients continue living, after surviving surgery? After all, the small intestine is the organ which is responsible for absorbing the nourishment for the body. Its walls are designed to allow digested food components to pass through and into the blood stream, which distributes this nourishment to the whole body.

If only a foot or two of this important organ remains to handle the traffic of digested food, how can the body possibly get enough nourishment?

This problem and the remarkable manner in which the body adapts itself to the new conditions is a subject of a report in *GASTROENTEROLOGY* by scientists in the University of California School of Medicine, San Francisco, and the Walter and Eliza Hall Institute of Medical Research, Melbourne, Australia.

The report is part of a study which Dr. T. L. Althausen, professor of medicine in the California institution, has been conducting for several years. Dr. Althausen's colleagues were Dr. Kahn Ueyeyama, of California, and Dr. R. K. Doig and Miss S. Weiden, of Australia.

The scientists report two cases. One is an Australian man of 50 who developed an

obstruction and extensive gangrene of the small intestine. The other is an American woman who had intestinal ulcers and inflammation with many ulcers. Each retained about two feet of small intestine.

There were three principal ways the body compensated for the loss of the greater part of the intestine.

At first it was impossible for the body to get enough nourishment by ordinary routes; so artificial feeding was employed. But in time the remaining fragment of small intestine expanded in diameter, increasing the absorption surface and the capacity of the abbreviated organ to pass nourishment.

Second, the colon assumed some of the absorptive functions of the small intestine.

Third, there was a weight loss. This loss was great immediately after operation. As the body became adapted to the situation, however, there was some increase, the weight leveling off somewhat below normal pre-operative figures. With this lighter weight, the nourishment requirements were reduced to a scale compatible with the capacity of the abbreviated small intestine.

The physicians feel that many individuals, who would have died in earlier years, will now not only survive operation, but be able to live comparatively normal lives. They point out that the Australian male now is continuing his normal occupation as a sailor on a coastal steamer, and he eats the regular food of the ship's mess. The American housewife cares for a family of three, gardens, and considers a slight intestinal instability her only problem.

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tempted to do this

The feat will have been accomplished by Dr. Eleanor Alexander Jackson, Rosenwald research fellow at Cornell Medical College for the past three and a half years. Dr. Jackson thinks other researchers may have grown the leprosy germ successfully but not recognized it in the different form in which she finds it grows outside the body. Work with the pleomorphic form of TB germs, which are distant cousins of leprosy germs, led Dr. Jackson to study leprosy from this angle.

Material, called lepromin, prepared from Dr. Jackson's pure growths of leprosy germs has been injected into the skin of leprosy patients. It gave the same reactions as the lepromin ordinarily used for leprosy skin tests. This seems to confirm Dr. Jackson's belief that she has actually grown the leprosy germs outside the body. The lepromin ordinarily used is obtained from leprosy nodules of patients and is crude material, containing other things besides lepromin.

Dr. Jackson has injected her cultivated germs into mice. After eight months, equivalent to 20 years in man's life, the mice developed sores on their skin very like the sores in human leprosy. Skin tests of these animals with lepromin obtained from the U. S. Leprosarium at Carville, La., gave reactions indicating that the mice had leprosy.

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CHEMISTRY

Diels-Alder Reaction Gains Nobel Prize

➤ AN IMPORTANT chemical reaction, originated by two German chemists Drs. Otto Diels and Kurt Alder over 20 years ago, has won for them the 1950 Nobel prize for chemistry. Acknowledged as a great help in synthetic rubber and other chemical manufacture that was successfully used by the Germans in World War II, the Diels-Alder reaction is nevertheless not widely known and is referred to only in technical chemical books.

The Diels-Alder reaction is a general method for making organic chemicals. By means of it chemicals of the class of synthetic rubber material can be converted into compounds of quite different type.

Butadiene, chloroprene and similar rubber ingredients are compounds whose carbon atoms are joined by double bonds but arranged in a straight line. In the Diels-Alder reaction such materials are made to combine with the chemical maleic anhydride. The result is an aromatic material whose carbon atoms are joined in ring-shaped structures.

These ring compounds, which are very useful to the organic chemist, occur in coal tar, but can be made in the laboratory by only a few methods. Of the possible processes of making wanted ring compounds to order, the Diels-Alder process is one of the simplest.

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MEDICINE

Leprosy Germ Cultivated

Organism from blood of leprosy patients, believed to be the cause of the disease, now reported grown outside the human body.

➤ A GERM from the blood of leprosy patients, believed to be the cause of this dreaded disease, has now been grown outside the human body.

If confirmed by other scientists, this will be the first time that the leprosy germ has been cultivated outside the human body, though scientists for many years have at-

PUBLIC HEALTH

Puerto Rico Commended

Death rate being reduced, but island needs help from mainland for 84,000 families living in unhealthy slums, one-fourth of population illiterate.

► PUERTO RICO is "commended" by Federal Security Administrator Oscar R. Ewing. At the same time, Mr. Ewing urges mainland U. S. citizens to give further aid to this island dependency.

This will shock many Americans, coming so soon after the attempted assassination of President Truman by two Puerto Ricans and Puerto Rican attempts at revolt from the U. S.

The point on which Mr. Ewing praises Puerto Ricans and appeals for more U. S. aid, however, is undoubtedly pertinent. The irony of Mr. Ewing's statement appearing at this time is accidental and due to a prearranged printing schedule.

The statement concerns the "Needs of Children of Puerto Rico" as determined by the Interdepartmental Committee on Children and Youth, of which Mr. Ewing is chairman. If some of these needs had been met two decades or so ago, there might not have been the attempt on President Truman's life that shocked the nation. For example:

Over 84,000 families in Puerto Rico in 1947 were crowded into unhealthy slums.

Over one-fourth of the population over

age nine in 1946 could not read or write (In continental U. S. the figure is 2.7% of the population over age 13.)

Almost half, 46%, of the teachers employed in 1948 did not meet the requirement of normal school certificates for elementary teachers and university degrees for high school teachers.

Almost half the children, 48%, never go beyond fourth grade.

Only about one-third of the children needing social services are being reached.

These and other findings of the Interdepartmental Committee paint a picture of conditions of poverty, over-crowding, ill health and ignorance, or the little knowledge that is proverbially dangerous. Such conditions are generally recognized as breeding restlessness, rebellion and crime.

On the bright side of the picture, the report points to recent reductions in deaths of mothers and children, free milk and food for infants and pre-school children, devotion of one-fifth of the insular budget to health services and 39% of the budget to schools, and increase in funds for recreation from \$23,000 in 1940 to \$525,000 in 1948.

Puerto Rico has accomplished much in the last half dozen years. Of the future, Mr. Ewing says:

"With a child population larger than in 32 of our 48 states and with a per capita income less than half that of our poorest state, Puerto Rico needs help from the rest of us if its children are to have the good start in life we crave for every child under the flag of the United States."

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METALLURGY

Better Alloys Asked To Offset Manpower Lack

► SINCE the western world suffers a manpower deficiency, it is vital that we give the men of our armed forces superior weapons, techniques and equipment.

That is the opinion of Maj. Gen. Ward H. Maris, expressed to the Washington section of the American Institute of Mining and Metallurgical Engineers. General Maris is chief of the Army's research and development division.

So far as metallurgy is concerned, the General asked his audience for more and better steel alloys, more and better titanium, magnesium and aluminum.

There is need, he pointed out, for utilization in tanks and other equipment, of low alloy steel, greater strength, of steel that is lighter and more easily welded. Lightness, he said, is important in considering the needs of airborne troops.

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ENGINEERING

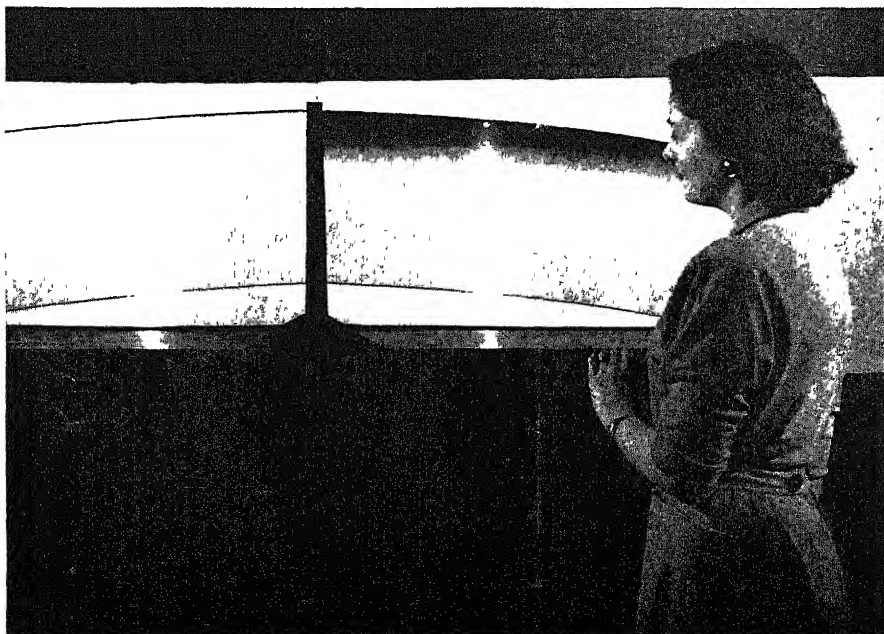
New Windshield Glass Lessens Road Glare

► MOTORISTS will benefit by a new automobile windshield glass that reduces road glare and heat. It is a glass of excellent optical qualities which is tinted a slight bluish-green in color and has a graduated shading above the eye level.

This tinted safety plate glass is a product of Libbey-Owens-Ford Glass Company and has already been thoroughly road tested in many parts of the United States. It passes the light-transmission requirements of the American Standards Association with a good margin to spare, according to G. P. MacNichol, Jr., of the glass company. Its use will make outside sun visors unnecessary.

The bluish-green tint in the glass itself is obtained by mixing iron oxides in the glass during manufacture. By balancing the ingredients properly, it was found possible to eliminate about one-third of the sun's glare-producing rays and one-half the heat rays and still preserve the optical qualities of the glass. A secret process is used to produce the modulated shading of the plastic in the upper part of the windshield.

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CUTS GLARE—On the left you see how bright sun or glare looks through the conventional windshield. At right glare is eliminated in the upper shaded portion.

GEOGRAPHY

Russians Lead U. S. In Arctic Knowledge

► THE RUSSIANS established a lead in knowledge of many Arctic conditions more than 13 years ago and they have maintained it up to today.

This is the opinion of Dr. H. E. Landsberg of the Research and Development Board expressed at the Alaskan Science Conference in Washington.

He asked the scientists present for much more research into Alaskan weather, ice, permafrost and terrain conditions and medicine.

"Frozen ground, ice cover, and snow," he pointed out, "have a large influence on military construction and mobility in the Arctic."

Knowledge of atmospheric and weather conditions, Dr. Landsberg said, would be helpful in such problems as radar screening, Loran navigation and long distance communications. Much better and more detailed maps are needed if troops are to be expected to operate over the vast, sparsely populated territory of Alaska.

Dr. Landsberg pointed to experiments on animals with the thyroid compound endo-thryn which increased their survival time in cold conditions by 54%. More work needs to be done with this compound, he said, before it can safely be used by man.

Research into ways and means of producing as much of the food and other necessities of troops in Alaska as possible, Dr. Landsberg said, would greatly ease the logistics problem.

Dr. Landsberg concluded by pointing out that most of the research projects that Armed Forces would like to see undertaken in relation to Alaska also would be beneficial in peacetime.

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PALEONTOLOGY

Alaska Yields Fossil Treasures

See Front Cover

► WHERE men once stampeded for gold, fossil-hunters have gone beyond and found another treasure.

Alaska's vast Brooks Range, mountain headwall of the Yukon and one of the least explored areas in the world, is a "majestic graveyard" of sea bottom animals that lived 300,000,000 years ago, Smithsonian Institution scientists revealed.

The discovery was made by a party of U. S. government geologists led by Dr. Arthur L. Bowsher Sr., a Smithsonian fossil expert. During the past summer the expedition pushed far into the Brooks Range, finding great glacial valleys whose only inhabitants were a few Eskimos.

The barren mountains which towered all around, the scientists found, were once

the bottom of ancient shallow seas. This was during the Mississippian era, when the most abundant life on earth were plant-like animals attached by stems to the ocean floors.

These were the crinoids. When they died, their skeletons became part of the muck at the bottom, and then fossils in solid rock. In later upheavals, Alaska rose from the seas, and the mountains which the scientists explored this summer buckled up from the land.

The crinoids found by the expedition were largely new types, not before known to science.

The party was flown to the Brooks foothills by Alaskan bush pilots, jumping country which earlier expeditions had to cross by dogsled, going up the Yukon and through the river divides of its tributaries with great hardship.

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MEDICINE

St. Louis Strip Reveals Diabetes

► THOUSANDS of Americans saw the "St. Louis Strip" this week (Nov. 12-18).

Unlike the burlesque show its name suggests, this strip act is one for the family. It may prevent untimely deaths from diabetes.

It carries the endorsement of medical authorities, because it is intended for quick, inexpensive detection of unsuspected diabetes. With its aid, the American Diabetes Association hopes to find many of the 1,000,000 Americans who have the disease and do not know it. Those who are found can through proper treatment be saved from diabetes death.

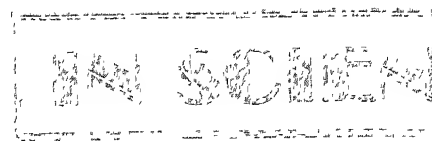
The strip consists of a strip of paper, roughly four by one inches. Most of its length is for name, age and sex of the person to be tested. Attached by a strip of plastic is a small piece of specially treated coarse filter paper. To use it, the filter paper end is dipped into the urine an hour or so after a heavy meal, preferably the evening meal. Then it is set aside to dry. Next morning it is mailed to the testing center.

At the center, it is dipped in a testing fluid. If the strip turns blue, there was no more than the normal amount of sugar in the urine and the individual does not have diabetes, or at least does not have untreated diabetes. If the strip turns green, yellow or red, it means sugar in the urine and the person needs to see a doctor for further examination and treatment. About 60 strips a minute can be tested.

Development of the strip is based on the finding by Dr. Norman Drey of St. Louis that urine can be dried and the sugar it contains preserved.

St. Louis, where the strip originated, and Seattle, Wash., are where it is getting its use.

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MEDICINE

Find Treatment for Major Tropical Disease

► THE FIRST successful treatment of "Oncho," a major tropical disease affecting some 20 million persons in Central and South America and Africa, was reported by Drs. Thomas A. Burch and L. L. Ashburn of the U. S. National Institutes of Health and the Pan-American Sanitary Bureau at the meeting in Savannah, Ga., of the American Society of Tropical Medicine.

"Oncho," short for onchocerciasis, is caused by tiny, worm-like organisms which are spread by a black fly called simulium or buffalo gnat. From a third to half the disease's victims have eye complications and one or two of every 100 patients are blinded.

The treatment reported uses two drugs. One, Hetrazan, was reported "spectacularly effective" in causing rapid disappearance of the microfilariae that cause the disease. But its effect was only temporary. Sumarin, also known as Bayer 205 or Germanin, was more effective over longer periods because it destroyed both the micro, or baby, and the adult worms of the disease. Using both together combines the speed and the lasting action.

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MEDICINE

Artery Hardening Induced By Cortisone and ACTH?

► A HINT that one kind of artery hardening, called atherosclerosis, might be brought on prematurely by prolonged treatment with the anti-rheumatism drugs, cortisone and ACTH, appears in a report to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Nov. 11).

The report is by Drs. David Adlersberg, Louis Schaefer and Stanley R. Drachman of Mount Sinai Hospital, New York.

The "possible development of premature atherosclerosis" is suggested by two findings:

1. Some patients getting cortisone or ACTH for long periods develop an excess of cholesterol in their blood. The New York doctors observed this in 77% of courses of treatment. Excess in the blood of this fatty substance is believed linked to development of the artery hardening condition.

2. Premature atherosclerosis has been seen in patients with Cushing's syndrome, and many of the other signs and symptoms of this condition, such as "moon face" and a form of diabetes, have occurred in some patients getting prolonged ACTH or cortisone treatment.

Science News Letter, November 18, 1950



GEOLOGY

Alaskan Volcanic Ash Shows How Soil Forms

➤ **FERTILE** soil is the foundation of human life. On Mt. Katmai in the Alaskan Peninsula is the one place in the world where men can study, at first hand, the steps by which soil is built, Prof. Robert F. Griggs of the University of Pittsburgh told U. S. and Canadian scientists at an Alaskan Science Conference in Washington.

Katmai volcano blew up in 1912, one of the two great eruptions in the past century. The other was at Krakatao in the East Indies in 1883. Around both were laid down thick layers of pure, sterile volcanic ash.

These have been the only explosions, within the era of modern science, large enough to afford an opportunity for studies of how soil starts, Dr. Griggs said.

So far, he said, no one has ever witnessed the formation of a mature soil from dead minerals. Studies were conducted at Katmai up until 1930; even then, ash lying as it fell was entirely inhospitable to ordinary plants, Dr. Griggs said.

Now, he reported, revegetation has begun. Plants have come in on the ash.

Dr. Griggs recommended a thorough survey of the area, with all present knowledge of soil micro-organisms and chemistry brought to bear. Katmai offers an opportunity for research not to be duplicated elsewhere on the globe, he said. But the opportunity is in danger of being missed.

Science News Letter, November 18, 1950

MEDICINE

Diet May Prevent Amebic Dysentery

➤ **AMEBIC** dysentery, or amebiasis, which plagues a million people in the United States and millions more in the tropics, may some day be prevented by diet.

Hope for this appears in a discovery reported by Miss Jane Taylor and Drs. Joseph Greenberg and Edward Josephson of the U. S. Public Health Service's National Institutes of Health at the meeting in Savannah, Ga., of the American Society of Tropical Medicine.

So far, their findings apply only to guinea pigs. The exact type of diet that might be recommended to humans has not been worked out.

The discovery itself was made accidentally. Miss Taylor and associates were trying to infect guinea pigs with the amebas that cause the disease, so as to have a laboratory animal instead of humans to test new treatments and the like. Emetine, the drug now

used, is slow, disagreeable and frequently not successful. Aureomycin, one of the so-called mold drugs, is more promising.

When Miss Taylor was trying to infect guinea pigs, the regular guinea pig diet was not immediately available. So the animals were fed a diet of rat pellets and kale. To her surprise, eight out of 10 guinea pigs injected with amebas came down with the disease. Previous efforts to give it to these animals had met with little success.

She repeated the experiment, in the careful way of scientists, but this time the guinea pigs were on their regular diet. And there were no cases of amebiasis.

Since the only difference was the diet, they proceeded to test this further. With one kind of diet, 96% of the animals became infected. With another diet, 85% got infected. With normal guinea pig diet, only 37% were infected.

What basic nutritional factor makes guinea pigs more susceptible to the amebic infection is not known yet. Scientists have long known that some humans got the disease when exposed to it, while others similarly exposed did not. The findings reported open the possibility that diet is what makes the difference.

Science News Letter, November 18, 1950

METALLURGY

Better Beryllium by Powder Metallurgy

➤ **BETTER** beryllium metal parts in the nuclear reactors used in atomic energy work is promised as a result of investigations in powder metallurgy which indicate that a more ductile beryllium can be formed by this process.

The importance of beryllium in atomic energy work is due to its mechanical, chemical and other properties, particularly its low neutron capture properties. Beryllium metal has low density, good resistance to corrosion and high relative strength.

Investigations of beryllium articles made by the powdered metallurgy method was described in Chicago to the American Society for Metals by Dr. H. H. Hausner and N. P. Pinto, both of Sylvania Electric Products, Inc., Bayside, Long Island, N. Y.

Beryllium pieces produced by usual casting and extrusion methods appear to lack ductility at room-temperatures. Beryllium powders can be compacted into solid pieces at room temperature without difficulty, these scientists found. No binder is needed.

In order to obtain a material of fairly high density, the beryllium compacts may be heat-treated, or sintered, in a high vacuum or in a protective atmosphere such as argon. The process is carried out at temperatures below the melting point of the metal.

Vacuum-sintered beryllium has measurable ductility. Argon-sintered beryllium compacts are brittle. Vacuum-sintered beryllium can be reduced 9% in thickness by cold-rolling, followed by annealing, which gives an improved product.

Science News Letter, November 18, 1950

ENGINEERING

Remove Dust from Films For Clearer Pictures

➤ **LESS** dust on motion picture films, with resulting better pictures, is promised in Rochester, N. Y., by scientists of the Eastman Kodak Company.

They have developed a new way of determining the electrostatic charge on the film. It is this charge that attracts the dust particles.

Motion picture film, or any photographic film, becomes electrified when rubbed or passed over rollers. When electrified the films attract dust. Certain combs do the same thing after being stroked through the hair. Measuring accurately the electrostatic charge on motion picture films is the first step in eliminating the trouble.

The new charge-measuring device shows that films receive varying charges from different materials. Dry velvet, for example, does not appreciably change the charge on certain films when rubbed on either the emulsion or support side. Velvet wetted with carbon tetrachloride will hold the film at a constant charge when rubbed on the emulsion side. But when it is rubbed on the support side, the film is almost completely discharged, and thus less likely to attract dust.

Science News Letter, November 18, 1950

PHYSICS

Pickup Devised for Underwater Sound

➤ **A TOTALLY** different way of picking up sounds in a liquid, with possible application to submarine detection, was reported to the Acoustical Society of America meeting in Boston.

Ultrasonic waves, much higher than humans can hear, hit a wire covered with a porous coating that is under water. The ultrasonic waves set up in the wire an alternating potential of the same frequency as the sound waves. This effect occurs regardless of the kind of metal used in the wire, Drs. John Bugosh, Ernest Yeager, Frank Hovorka and Harry Dietrick, of Western Reserve University, Cleveland, told the meeting.

They found that the effect appeared to depend on the type of porous covering and the solution with which the wire is covered. The voltage occurs either when the wire is in water or in a dilute electrolyte, a solution that will support an electric current. While the voltage produced is small, it can be stepped up, or amplified, to give the necessary signal.

This discovery is expected to be used extensively in the laboratory where scientists studying sound effects can now use a small wire to pick up sound. Heretofore they have had to depend on much larger hydrophones, ones that might have some effect on the sound being studied.

Science News Letter, November 18, 1950

ENGINEERING

Fuel To Be Plentiful

We will all keep warm this winter unless there is unforeseen slow-down in production. Kerosene may be scarce because it fuels jet planes.

By A. C. MONAHAN

➤ THERE will be fuel enough to keep American homes comfortable during the coming winter unless a greater emergency should develop or there should be unexpected slow-down in production.

Kerosene may be in short supply because it is the principal fuel for jet-propelled planes. Heating oils may be a little less efficient because certain components ordinarily included are needed in high-octane aviation fuels. No shortages in coal, wood and natural gas are foreseen.

Military needs for high-octane components of aircraft fuels, and they are mounting, will lower the octane value of civilian motor gasoline. If an all-out-war need for large quantities of jet fuel should develop, it will cut deeply into kerosene, range oil and other fuel production. An improved fuel for jet planes uses a mixture of kerosene with heating and diesel oils.

On the other hand, the oil industry is now producing some 3,000,000 barrels of motor fuels a day, and another 500,000 barrels a day could be produced. Along with this increased production of motor fuels, heating oil production might increase.

Coal First Choice

While coal is still the number one fuel used in heating American homes, it is fast losing its place to oil and gas. Exact figures of oil-heating of homes are not available but a two-year-old estimate indicates some 4,000,000 homes used oil for fuel at that time. About 7,200,000 households now heat with gas, according to the American Gas Association. Oil and gas gains in home heating follow developments in U. S. industry. These fuels now supply 56% of the nation's energy requirements.

Coal's share is 38% as compared with 71% in 1925.

American scientists are actively developing home-heating systems which do not use the customary fuels. Capturing and putting to work the direct heat of the sun is one. Abstracting heat from the cold earth below frostline or from cold water in deep wells is another. This requires energy to operate so-called heat pumps, but uses economical energy from electrical sources.

Heat from Sun

Solar energy used to heat the homes of the future may be the result of experimental work under way in many parts of the country. An experimental solar house at Cambridge, Mass., operated by the Massachusetts Institute of Technology, got three-fourths of the heat needed to keep it comfortable during the past winter from the direct energy of the sun.

In this five-room house the sun's rays, passing through a heat collector on its southern roof, heated water in a tank. The water then circulated through radiators in

the various rooms, or stored the heat of sunshiny days for night and cloudy conditions. For extended cloudy periods, electrical heat was used to supplement the stored heat. This is but one example of many types of solar houses under experimental development.

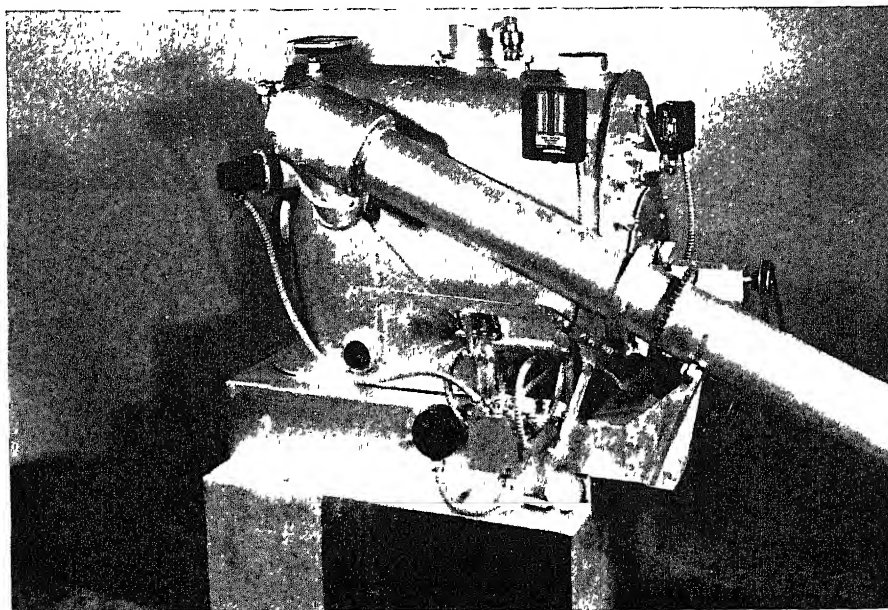
Many houses in the United States, and in foreign countries as well, are being successfully heated by means of heat-pumps which circulate a refrigerant through pipes buried in the earth below the frost line or extending into deep water wells. The principle involved is the mechanical refrigerator in reverse.

Always Heat in Earth

No matter how cold the earth or water may be, there is some heat in it. The refrigerant, tending to evaporate in the pipes, picks up heat which is accumulated and delivered to the house.

No matter what type of fuel is used to heat the home there are two essentials in economic heating. One is a house tight enough to hold heat; the other is a well-cared-for and efficient furnace. Economical heating can not be expected with a "leaky" building, or if the heat from the fuel is wasted up the chimney.

One of the first essentials in home heating is to fill cracks and crevices through which heated air from the inside gets out.



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SUN WARMED—Large windows in the living room of the Massachusetts Institute of Technology solar house in Cambridge, Mass., help capture heat from the sun, but the main capture device is on the roof above. The heat storage tank containing water is just under the roof.

or cold air from the outside gets in. These air passages may be around the window and door frames, between frames and sashes, along sills in the basement or eaves of the roof. Stuffing with rags or paper will close them. Better, however, are some of the putty-like materials plentiful on the market which were developed for this particular purpose. Weatherproofing strips, easily inserted between sash and frame of a window, make tight, leak-proof joints.

Double windows, particularly on the windy side of a house, will pay for themselves in a very few seasons. Some engineers say they can save up to 25% on fuel costs. Evidence of their value is immediate with a touch of the hand on the inside of a single window, and then on the inner pane of a window opening having double windows.

A furnace to be efficient must be clean. If the inside flues through which air or water to be heated are coated with soot from the fire, heat does not get through. A layer of soot is an excellent insulator. Any householder, with the wire brushes available for the purpose, can keep the flues clean. Dampers and checks must also be kept in good condition.

Very important in keeping a house warm, where coal is used as the fuel, is proper firing. Smoke rolling from the chimney is usually a sure sign of waste and improper firing. Anthracite users, of course, have no trouble from smoke. But if a shovelful of bituminous coal is scattered over a hot

fire, volumes of soot and volatile unconsumed combustible gases immediately arise and escape up the chimney.

Good firemen heap the bituminous in a

conical pile in the center or in a sloping pile on one side. Combustion then takes place along the edges of the slopes.

Science News Letter, November 18, 1950

AERONAUTICS

Plane Spotting Obsolete

More than 150,000 volunteer civilian aircraft spotters taking part in recent training exercises were wasting time. Process too slow and outmoded by radar.

➤ MORE than 150,000 patriotic volunteer civilian aircraft spotters wasted their time in a recent weekend test, learning something which is obsolete and will be of little use to the defense of the United States. And thousands more will do so as the training program continues.

Volunteer airplane spotters on training exercises spend two hours or more in their observation posts. Every plane a volunteer sees, he reports through regular telephone channels to an area filter center. This report then is coordinated with others, plotted and relayed to radar centers. Radar centers evaluate the reports and send jet fighters after theoretical enemy planes.

By the time all this time-consuming process has been followed, the "enemy planes" would have A-bombed the coastal cities and headed out to sea again.

Even in World War II, plots from civilian spotters were always behind plots from radar in our coastal cities. Sometimes the lag was as much as five minutes.

It is almost impossible to tell by the eye alone whether a bomber flying at 40,000 feet is friend or enemy. It is impossible to identify fighters at that height. Radar can do this instantaneously because friendly planes carry an electronic device known as IFF—"Identification, Friend or Foe." In addition Russia is believed to have in production a plane that looks almost exactly like our B-29.

Higher top and cruising speeds of bombers and the increased altitudes at which they fly will not give the air defenses time to use the information which comes from the civilian spotters. The B-29 top speed is over 350 miles per hour, the B-36 top speed over 435. The Russians may well equal or surpass that.

Jet fighters have an extremely fast climbing rate—how fast is a secret—but if they had to depend on civilian spotters for information, in many cases they could not even start climbing until after an enemy bomber had done its damage and started home.

During World War II most vital American coastal cities were ringed with radar networks. They could spot planes as far as 150 miles out at sea. Some present-day radar sets can spot storms—and presum-

ably planes—as far away as 250 miles. Civilian spotters are not able even to see the planes until they are over land.

The Defense Department is currently constructing a radar network in Canada and along our other borders. During war it is likely radar-carrying ships will cruise off shore. A vast network of civilian spotters will not be able to give as much or as accurate information as this network. Nor will the spotters be able to give this information as fast.

Science News Letter, November 18, 1950

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PUBLIC HEALTH

Brucellosis Is Widespread

Countless persons in the United States, Europe, Africa, and many parts of the Orient suffer from this disease contracted from cows, swine and goats.

➤ FROM 40,000 to 60,000 persons in the United States and countless others in Europe, Africa and many parts of the Orient are afflicted with the serious, long drawn-out and sometimes fatal disease called brucellosis. Other names for this sickness that killed Edsel Ford are undulant fever, Malta fever and, in cattle, infectious abortion.

It attacks cows, swine and goats. Humans get it from these animals, either through infected milk or through contact in their work of tending the animals or processing them for foods.

On the European continent, exclusive of the Scandinavian countries, it is estimated that between 15 and 30 of every 100 dairy cattle are infected, Dr. Martin M. Kaplan, Veterinary Officer of the World Health Organization at Geneva, Switzerland, declared at the Third International Congress on Brucellosis in Washington.

"Brucellosis has followed wherever the European breeds of cattle have been introduced in other parts of the world, such as

parts of Africa, India, China, Japan and Oceania," he reported.

The World Health Organization and the Food and Agriculture Organization have designated 14 brucellosis centers in different countries to study the situation in various regions and work out methods of controlling the disease.

In the Argentine coastal region, 90% of the brucellosis cases are found among slaughter house and meat packing plant workers, Dr. E. A. Molinelli and associates of the Malbran Institute, Ministry of Public Health, reported. But in the towns and villages of the Andean region, the chief source of human cases is goat milk products, principally cheese. Drinking milk is not an important source in Argentina because the habit of boiling milk is widespread.

In the United States reported human cases reached a peak of 6,147 in 1947, dropping to 4,143 in 1949, Dr. James H. Steele and L. Otis Emik of the U. S. Public Health Service reported.

Reported cases, however, may be only one-tenth of possible human cases, they pointed out. Difficulty in diagnosing the disease, which mimics many other conditions, and entire absence of reporting because the patient did not see a doctor are among the reasons for the discrepancy between number of reported cases and the number most authorities believe actually exist.

Use of antibiotic drugs, such as penicillin, aureomycin and others for patients sick with fever may also cut down the number actually diagnosed, the Public Health Service doctors said. Patients might be treated and get well without the doctor ever having definitely diagnosed what ailed them, it was suggested.

The long incubation period between infection and the development of sickness and reinfections or relapses also complicated the picture.

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ENGINEERING

Atomic Power's First Use May Be In Ocean Vessel

➤ FROM the present outlook it appears that ocean vessels will be the first to use atomic energy otherwise than in a bomb. The first actual application of this type of energy in propulsion may be in a submarine.

Aviation is looking forward to supersonic bombers powered with atomic energy

that will be able to circle the world in non-stop flights. Predictions are being made that atomic energy will power industrial plants. By-product heat from a government atomic pile may soon be put to work, but the application of atomic energy to industrial plants is not yet a principal objective of nuclear scientists.

Scientists and engineers, however, are hard at work in the design of equipment to use atomic energy in the propulsion of ocean vessels, submarines and airplanes. A major problem at the Knolls Atomic Power Laboratory, Schenectady, N. Y., is the design of a shipboard atomic plant for the U. S. Navy. This laboratory is operated by General Electric for the U. S. Atomic Energy Commission.

Scientists at Oak Ridge Laboratories, Oak Ridge, Tenn., under the sponsorship of the Fairchild Engine and Airplane Corporation, are working on atomic energy as a source of propulsion for aircraft.

One important reason why atomic energy can not be used for all types of propulsion is the enormous weight of the shield around the reactor to protect personnel from dangerous radiation. The usual shield is a six-foot enclosure of special concrete. Its weight would mean little on an ocean vessel, being far less than that of the fuel which now must be carried but would be unnecessary with atomic power. Shield weight presents an important problem in aircraft and, perhaps an insoluble problem in railway locomotives and automobiles.

Some general facts about the submarine atomic reactor being developed at the Knolls laboratory were recently revealed by K. A. Kesselring, assistant head of the laboratory's engineering division. It will use, he said, an atomic reactor operating at a very high temperature to produce heat. The heat, in turn, will be transferred to liquid metal in a closed low-pressure system, and thence to a boiler where steam will be generated to drive steam turbines.

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MEDICINE

Smallpox Vaccine Prevents Mouth Blisters

➤ BLISTERS in the mouth, something like canker sores and fever blisters, that keep coming back can be successfully treated and prevented in some cases by smallpox vaccine.

Details of the treatment, which involves giving gradually increasing doses of the vaccine, were reported by Dr. Donald A. Kerr of the University of Michigan School of Dentistry at the meeting in Atlantic City of the American Dental Association.

Aureomycin, one of the new "wonder drugs," also is "somewhat effective" in treating the condition but does not provide immunity against further attacks, Dr. Kerr said.

Secondary herpetic stomatitis is the name dentists give the condition.

Science News Letter, November 18, 1950

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PUBLIC HEALTH

Malaria Toll Unnecessary

Failure of unit commanders to carry out health order to take atabrine twice a week cost Seventh Army almost 500 men a month in African campaign.

➤ BECAUSE unit commanders failed to carry out a health order to take atabrine twice a week, the Seventh Army lost thousands of its men to malaria during the African campaign in World War II

The actual malaria rate in part of 1943 was 30 per 1,000 men which on a divisional basis means almost 500 men a month in the Seventh Army. About as many more were evacuated with "fever of unknown origin" which was in reality malaria.

This example of unnecessary loss of fighting men during a campaign was given by Dr. Perrin H. Long of the Johns Hopkins University School of Medicine, at the meeting of the Association of Military Surgeons in New York.

The responsibility for maintaining health in any military unit, he pointed out, rests on the commander of the unit. The medical officer may and should advise on all health matters, but it is up to the commanding officer to issue orders and see that they are carried out.

The Seventh Army example, Dr. Long said, "is but one of a number of instances which could be cited as examples in which a lack of command responsibility resulted in serious losses of manpower at the height

of combat"

Medical science has made such strides in prevention of disease that the Armed Services could establish maximal permissible disease rates for certain diseases. If a unit had more cases of such disease than the permitted rate, the commander could and should be disciplined, Dr. Long declared.

The British Army has followed this procedure since 1945. One British unit commander was actually relieved of his command because of an excessive malaria rate within his unit.

Dr. Long also advises that when an officer's efficiency is being considered in connection with his promotion, the health record of his unit should be studied.

Establishment of maximal permissible disease rates and disciplinary action against commanders in whose units these rates are exceeded may seem "revolutionary," Dr. Long said. But, he added, they "would appear definitely desirable in a day when military manpower is such a critical item in our program for national security.

"He who wastes it should not go unscathed," quipped Dr. Long.

Science News Letter, November 18, 1950

MICROBIOLOGY

Mildew-Resistant Fabrics

➤ NEW cotton fabrics that will stand up in the jungle to mildew and rot are the goal of tests by the Army Quartermaster Corps and U. S. Department of Agriculture around the world.

Anti-mildew cloth is badly needed by the armed forces for tents and uniforms that will not fall apart after a short stay in hot, tropical regions. During World War II, fabric losses to the tiny organisms that cause fiber decay were drastic. Tentage, clothing and other equipment, particularly in the South Pacific, fell victim to molds and fungi at an alarming rate.

To test various new anti-mildew chemicals, at least four exposure stations will be set up in widely separated parts of the world. Experiments will be carried out over the next several years at these stations.

One will be in New Orleans. There, test fabrics will be treated with various fungicides by scientists at the Agriculture Department's Southern Regional Research Laboratory, and part of the cloth will be exposed to the humid, subtropical Louisiana weather.

A hot-and-dry test station will be established by the Quartermaster Corps at Las Cruces, N. Mex., to test fabrics under desert conditions. Other exposure centers are to be overseas, one probably in the Caribbean, the other in the South Pacific for severe tropical conditions.

From the actual weathering experiments, the scientists hope to check the validity of test-tube methods for predicting fabric resistance to rot and mildew. The experiments will also provide the most extensive data ever collected on the actual effectiveness of anti-mildew, anti-rot chemicals on cotton cloth.

Science News Letter, November 18, 1950

GENETICS

Inherited Abnormalities Bar to Marriage

➤ PEOPLE born with slight physical abnormalities should not marry other people with similar abnormalities if they intend to have children. This warning was issued by Dr. E. B. Ford, Oxford University geneticist,

at the conference in London on "The Biological Hazards of Atomic Energy."

Dr. Ford said slight abnormalities may indicate that a person carries a damaged gene which is partly neutralized by the presence of its normal counter-part.

However, the children of two such persons may inherit a damaged gene from each parent and, under this double dose, they may be doomed to extreme physical deformity.

As an example of this type of hereditary abnormality Dr. Ford mentioned brachydactylia, which is an abnormal shortness of the fingers and toes.

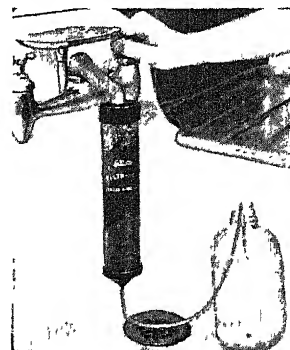
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Wild Turkey

➤ OF ALL the birds which hunters seek over fields, woods or water, one of the most toothsome is the wild turkey. It is also a very large bird, slow and flopping in flight, an easy and inviting target since the days of the Pilgrims' blunderbusses. The fact that turkeys graced the first Thanksgiving table in Plymouth was not a compliment to the accuracy of those old guns. There were a lot of turkeys in the woods in those plentiful days. To hit one roosting in a tree was more a matter of spraying the whole tree with a full charge of shot.

Hunted out of existence in New England, its numbers pitifully thinned even in the mountains of the South, the turkey today has an understandable hesitancy to take to the air. If surprised while feeding in the stubble of an open field, it would much prefer to make a run for the woods than to fly. Once the thickets are reached, it can disappear against a background of autumn leaves like a phantom, for its dark-brown plumage, highlighted by green, gold and bronze, is a perfect camouflage.

Both the wild turkey and his plumper domesticated cousin are natives of North America. But as it happened, the tame turkey came to the American colonies from Mexico by way of Europe. Cortez and his

Spanish conquerors found turkeys being grown by the Aztecs in the early 1500's and took them back to Europe. A century later, when the Pilgrims came to New England, the domesticated Mexican turkey came with them. The New England wilderness was already full of the wild Eastern variety.

Once common as far north as Canada, today the wild turkey is not found north of Pennsylvania. In the mountains of the Virginias and Carolinas, Tennessee and Kentucky there are larger flocks today than there were 30 years ago, when rigid protection by state laws and active endeavor to increase their numbers began. Colorado, introducing the once abundant large Mer-

riam's turkeys, had the first open season on turkeys in 50 years last October.

In its natural habitat, the turkey is one of the shyest birds known. In the summer the mating calls give their presence away in the mountains, as the big toms gather their wives (normal complement for a strong male is at least three). This marital unbalance seems to make family life somewhat strained among the turkeys. When the hens go off to lay their eggs, they take great pains to hide the nest from the gobbler. He will break the eggs or kill the young birds if he comes upon a nest.

Science News Letter, November 18, 1950

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ALASKA FISHERY AND FUR-SEAL INDUSTRIES—1947—Seton H. Thompson—Gov't. Printing Office, U. S. Dept. of the Interior Stat. Digest No. 20, 78 p., illus., 25 cents.

THE ART OF SCIENTIFIC INVESTIGATION—W. I. B. Beveridge—Norton, 171 p., illus., \$3.00. The author turns to look at research itself and examines basic principles and mental techniques that are common to most types of investigation.

BASIC ELECTRICAL MEASUREMENTS—Melville B. Stout—Prentice-Hall, 504 p., illus., \$7.75. An undergraduate text presenting the more important methods for obtaining measurements.

CHEMICAL THERMODYNAMICS: Basic Theory and Methods—Irving M. Klotz—Prentice-Hall, 369 p., illus., \$6.00. A textbook designed primarily for chemists.

A COLLECTION OF BIRDS FROM BOLIVAR, COLOMBIA, Part VII: Colombian Zoological Survey—Rodolphe Meyer de Schauensee—Academy of Natural Sciences of Philadelphia, 28 p., paper, 85 cents. The author records 125 species which he found in Bolivar during 1949.

COMPARATIVE ANIMAL PHYSIOLOGY—C. Ladd Prosser, Ed.—Saunders, 888 p., illus., \$12.50. An advanced college text.

EFFECTS OF DIVERTING SEDIMENT-LADEN RUN-OFF FROM ARROYOS TO RANGE AND CROP LANDS—D. S. Hubbell and J. L. Gardner—Gov't. Printing Office, U. S. Dept. of Ag. Tech. Bull. No. 1012, 83 p., illus., paper, 25 cents.

ELECTROMAGNETIC WAVES AND RADIATING SYSTEMS—Edward C. Jordan—Prentice-Hall, 710 p., illus., \$10.50. An advanced college text.

ENCYCLOPEDIA ON CATHODE-RAY OSCILLOSCOPES AND THEIR USES—John F. Rider and Seymour D. Uslan—Rider, 982 p., illus., \$9.00. A description of many types of cathode-ray oscilloscopes and synchroscopes manufactured between 1940 and 1950.

EVOLUTIONARY THOUGHT IN AMERICA—Stow Persons, Ed.—Yale University Press, 462 p., illus., \$5.00. Essays on nineteenth-century theories of organic evolution in American economics, sociology, literature, architecture and many other fields.

FERTILITY DATA IN POPULATION CENSUSES—Department of Social Affairs—United Nations (U. S. Distributor: Columbia University Press), Population study no. 6, 31 p., paper, 30 cents.

THE GOOD RAIN—Alice E. Goudey—Aladdin Books, 30 p., illus., \$1.75. A child's book telling what the lack of rain might mean to the city and country child. Illustrated by Nora S. Unwin.

GREAT AMERICAN NATURE WRITING—Joseph Wood Krutch, Selector and Commentator—Sloane, 444 p., illus., \$5.00. An anthology. Among the works presented are those of Thoreau, Devoe, Austin, Beebe and Wheeler.

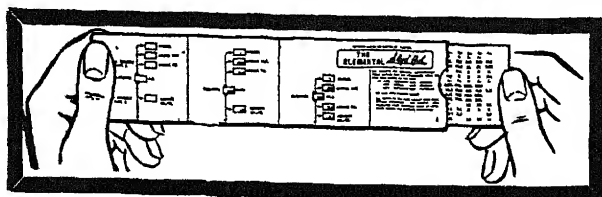
A LABORATORY MANUAL OF ELEMENTARY CHEMICAL ANALYSIS—Thomas H. Whitehead—Ginn, 64 p., illus., paper, \$1.25. A well-arranged laboratory manual for qualitative analysis.

LATIN TREATISES ON COMETS BETWEEN 1238 AND 1368 A.D.—Lynn Thorndike, Ed.—University of Chicago, 274 p., \$5.00. The Latin text of a number of treatises and passages on comets is presented. The editor has written a brief introduction to each.

LIFELONG BOYHOOD: Recollections of a Naturalist—Loye Miller—University of California Press, 226 p., \$2.75. A collection of the author's memoirs which trace the development of a naturalist.

MEDICAL CARE FOR SEAMEN: The Origin of Public Medical Service in the United States—Robert Straus—Yale University Press, 165 p., \$3.75. The author traces the evolution of public medical services for American seamen.

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MEDICAL JURISPRUDENCE AND TOXICOLOGY—John Glaister—*Williams and Wilkins*, 9th ed., 755 p., illus., \$7.00. A basic reference brought up-to-date. Of British origin.

THE MICROTOMIST'S VADE-MECUM (Bollis Lee). A Handbook of the Methods of Animal and Plant Microscopic Technique—J. Bronte Gatenby and H. W. Beams, Eds.—*Blakiston*, 11th ed., 753 p., illus., \$8.50.

NOTES ON SOME ASIATIC BIRDS—Charles Vaurie—*American Museum of Natural History*, 39 p., illus., paper, 25 cents. A report on these birds collected by Dr. Koelz in Iran, Afghanistan and India.

NOTES ON THE CUTTHROAT AND RAINBOW TROUTS WITH THE DESCRIPTION OF A NEW SPECIES FROM THE GILA RIVER, NEW MEXICO—Robert Rush Miller—*University of Michigan Press*, 42 p., illus., paper, 50 cents.

PERSONALITY AND PSYCHOTHERAPY. An analysis in Terms of Learning, Thinking, and Culture—John Dollard and Neal E. Miller—*McGraw-Hill*, 488 p., illus., \$6.50. Hypotheses to explain what happens in psychotherapy in terms of behavior theory.

PRINCIPLES OF INTENSIVE PSYCHOTHERAPY—Frieda Fromm-Reichmann—*University of Chicago Press*, 245 p., \$3.75. Formulated on the basis of the application of Freud's concepts and Sullivan's operational interpersonal relations.

RATES AND AMOUNTS OF RUNOFF FOR THE BLACKLANDS OF TEXAS—Ralph W. Baird and William D. Potter—*Gov't. Printing Office*, U. S. Dept. of Ag. Tech. Bull. No. 1022, 23 p., illus., paper, 10 cents.

SAFETY IN THE MINING INDUSTRY—D. Harrington, J. H. East, Jr. and R. G. Warncke—*Gov't. Printing Office*, Dept. of Mines Inf. Circ. 7485, 157 p., illus., paper, 40 cents. A statistical study.

THE SEA AND ITS MYSTERIES—John S. Colman—*Norton*, 261 p., illus., \$3.75. An introduction to the science of the sea. The geography of the ocean floor, the chemistry of the sea and the circulation of the water, currents, waves and tides are discussed.

SEVEN SCIENCE FICTION NOVELS OF H. G. WELLS—*Dover*, 1013 p., \$3.95. Among the novels included are *The First Men in the Moon*, *The Invisible Man*, and *The Time Machine*.

SEX AND TEMPERAMENT IN THREE PRIMITIVE SOCIETIES—Margaret Mead—*New American Library*, 218 p., paper, 35 cents. A pocket book edition of a work appearing in 1935.

SIR THOMAS BROWNE: A Doctor's Life of Science and Faith—Jeremiah S. Finch—*Schuman*, 319 p., illus., \$3.50. A biography of a famous 17th century doctor.

SNOW MELTING: Design, Installation and Control of Systems for Melting Snow by Hot Water Coils Embedded Beneath Walks, Roads, or Other Areas Where Snow is an Obstruction or Hazard—T. Napier Adlam—*Industrial Press*, 224 p., illus., \$4.50.

SPIDERS OF THE RHOICININAE (PISAUROIDAE) FROM WESTERN PERU AND ECUADOR—Harriet Exline—*American Museum of Natural History*, 13 p., illus., paper, 25 cents.

STEROID HORMONES AND TUMORS: Tumorigenic and Anti-tumorigenic Actions of Steroid Hormones and the Steroid Homeostasis Experi-

mental Aspects—Alexander Lipschutz—*Williams and Wilkins*, 309 p., illus., \$6.00. A study on how steroids may interfere in the dynamics of cancer.

TOOL ENGINEERING Analysis and Procedure—Lawrence E. Doble—*Prentice-Hall*, 499 p., illus., \$6.35.

ULTRAHIGH FREQUENCY ENGINEERING—Thomas L. Martin, Jr.—*Prentice-Hall*, 456 p., illus., \$8.00. A college text intended for senior students in electrical engineering or physics.

VIRUSES 1950—M. Delbruck, Ed. *California Institute of Technology*, 147 p., illus., \$2.50. Proceedings of a conference on the similarities and dissimilarities between viruses attacking animals, plants and bacteria, respectively. Held at the California Institute of Technology, March 20-22, 1950.

Science News Letter, November 18, 1950

ENGINEERING

Devise New Technique For Measuring Paint

► **THE THICKNESS** of paint and varnish coatings and how rust and tarnish form on metals are among the subjects being studied with new techniques described at a special symposium of the New York Academy of Sciences.

Dr. Jean-Jacques Trillat, director of the X-ray and Electronics Laboratory of the French National Scientific Research Center, described these new methods as well as a new apparatus devised to help in the measurement of coating thicknesses.

Use of X-rays and photoelectrons (charged particles thrown out from a surface by the action of light or other radiation) to study the surfaces of metals, alloys and minerals is one of the techniques. Another method is to use X-rays to analyze thin surface film on paper and biological objects. Still another method is to use X-rays that have been diffracted, or changed from their original path, to study corrosion and lubrication.

The new apparatus measures the angles between X-rays and the films at which the X-rays are directed. From them can be calculated the thickness of such substances as paint and varnish. The method also can be used to study the oxidation, or rusting, process; to identify alloys and to learn about the effects of surface polishing of metals.

Another technique described to the New York Academy of Sciences makes it possible to prepare a metal surface in a vacuum. This surface can then be machined in the vacuum at any desired temperature, thus permitting new research into the study of metal surfaces. It further allows the scientists to distinguish the physico-chemical factors such as adsorption and chemical affinity from the structural factors.

This new method helps laboratory study of the fresh, clean surfaces of solids, of the measurement of surface temperatures, of the results of machining metals and of how rust and tarnish form.

Dr. Trillat is a professor at the Sorbonne and an officer of the French Academy.

Science News Letter, November 18, 1950

ENGINEERING

Want To Aid Europe Without Losing Secrets

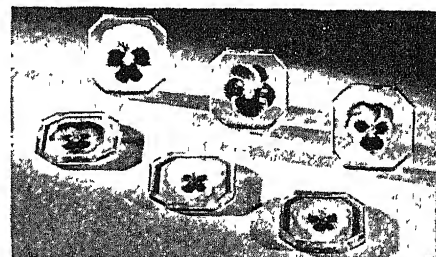
► **ONE KNOTTY** problem today is how to help European industries produce defense materials without handing them patents and "know-how" that can be used in commercial war on the United States.

Acknowledging that arming of the North Atlantic Treaty countries has been delayed by reluctance of U. S. industry to export their industrial and technological secrets without safeguards, one meeting of industrial and government representatives has been held in Washington.

In some of the countries that would be most helpful in making defense and military equipment, the concerns ready to do so are the world rivals of the American companies producing the needed materials in this country. If hard-won production methods are handed over to their European rivals, the American companies are fearful that their own know-how will be used to compete with them commercially as well as to equip the fighting forces.

Writing into governmental and commercial agreements safeguards to prevent abuses is being discussed further.

Science News Letter, November 18, 1950



REAL PANSY COASTERS

Made by embedding real pansies in Castolite, a new liquid casting plastic. Students can embed real flowers, butterflies, shells, photos, etc., to make interesting paper weights, coasters, jewelry, buttons, trays and many other distinctive objects. Use home tools.

Stimulates Student Interest Says Danville, Ky., Teacher

A Danville, Kentucky teacher writes: "Castolite has served a dual purpose in my class room. The children used it to preserve specimens of butterflies and wild flowers which had been collected as a science project. As a part of the functional art program, the more beautiful specimens were used to make paper weights and coasters. The unique process of preserving the science specimens was very fascinating to the pupils. It was an added stimulus to their work."—Mary Ann Kavanaugh, Teacher, Maple Avenue School, Danville, Ky.

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Our new "Liquid Magic" folder is fully illustrated in colors and shows the possibilities of this amazing material for class and hobby use. The idea is especially timely now, because Castolite creations make unusual Christmas gifts. "Liquid Magic" is FREE. Send a card or note of request to:

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For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., Washington 6, D. C. and ask for Gadget Bulletin 545. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

⚙️ **EAR PROTECTOR**, able to stop loud sudden noises from reaching the ear drum yet admitting conversational tones, fits comfortably into the ear canal. It is a sonic ear valve, without wires or battery, for soldiers, industrial workers and others near explosions.

Science News Letter, November 18, 1950

⚙️ **REVERSIBLE FAN**, for industrial applications, has a specially-designed propeller which will give an equal air flow in either direction as desired. One use is to circulate air in lumber drying kilns where one-way circulation may provide non-uniform drying.

Science News Letter, November 18, 1950

⚙️ **GAS MIXER**, for use with bottled butane or propane liquefied gas in rural homes, is a tank with two sections. When gas is drawn from the larger section, vapor is forced through a pipe leading out of the smaller section, producing a mixing agitation.

Science News Letter, November 18, 1950

⚙️ **POLYETHYLENE RINGS**, now used in some large television receivers to insulate the metal picture tube electrically, are formed by a curved extrusion which produces a curved shape free of distortion.

Do You Know?

Bulbs and neonics may be planted up until the ground freezes.

The dairy cow population of the United States is two cows to each 13 persons.

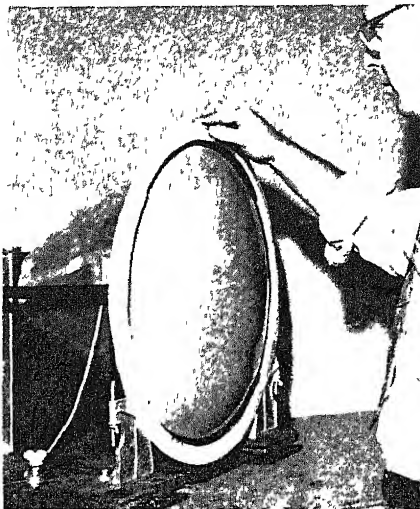
A two-seat, three-wheel, midget automobile is under construction in Norway.

The daintiest nest built by birds is probably that of the ruby-throated hummingbird.

Potatoes can be propagated by planting an eye from a potato and also from seed produced in balls that sometimes grow on the vines.

To be of standard weight, small eggs must weigh at least 18 ounces per dozen, medium eggs 21 ounces, and large eggs at least 24 ounces a dozen.

The first stage in the process of pickling cucumbers involves fermentation in which the physical structure of the vegetable is changed so that it can take up readily sugar, vinegar and other flavoring.



The photo shows a circular ring, but they can be made elliptical or in other curved shapes.

Science News Letter, November 18, 1950

⚙️ **IRON REMOVER**, to clean pipeflowing liquids of tiny particles that might damage such processing equipment as refiners, pumps and grinders, uses permanent mag-

nets. These are set up in a flow-interrupting unit which makes 30-degree angles with the pipeline.

Science News Letter, November 18, 1950

⚙️ **"OCCUPATIONAL" LENSES** for eyeglasses have segments which permit several fields of vision. Trifocals aid sight in close, medium and distant zones. For librarians, the distance segment may be in the center, with the medium segment above to enable seeing books on upper shelves.

Science News Letter, November 18, 1950

⚙️ **HAND-DRILL HEADLIGHT** to illuminate the work area was recently granted a patent by the government. An electrically-operated drill of the portable type has an electric bulb socket in a separate compartment in its forward end.

Science News Letter, November 18, 1950

⚙️ **PROJECTING EDGE** for the stove or kitchen table, to hold a meat grinder or other clamp-type kitchen tool, is provided by a square of wood with rubber suction cups on its lower side. Separation from the surface to which attached is easily made with a dull knife.

Science News Letter, November 18, 1950

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THE WEEKLY SUMMARY OF CURRENT SCIENCE



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A SCIENCE SERVICE PUBLICATION

NUTRITION

More Good from Food

A tenth to a third more nourishment obtained if one of the new antibiotics is taken with it. Suburban soil contains vitamin.

➤ A TENTH to a third more nourishment can be obtained from food if one of the new disease-fighting wonder drugs such as penicillin, aureomycin, streptomycin and terramycin antibiotics is taken along with it.

Experiments in animal feeding suggest that humans too can have their growth and health improved by these discoveries, Dr. C. G. King, scientific director of the Nutrition Foundation, reported in summarizing this year's food research.

Yet why these wonder drugs and recently discovered vitamins such as B₁₂ are effective is still a mystery.

Several groups believe that antibiotics can exert a stimulating effect on growth, beyond the effect of all known vitamins. Dr. King said there is widespread agreement that natural protein foods of animal origin such as liver, milk, meat and eggs contain essential nutrients beyond those now identified.

The number of new vitamins yet to be identified cannot be stated with any sense of finality, but from studies with chickens, turkeys, minks, cats, rats and pigs, research men are convinced that at least two and perhaps as many as four or five factors remain to be identified.

There is a great deal of interest in discovering the real function of the antibiotics when they stimulate growth. The scientists

ask: (1) are they suppressing microorganisms that normally retard the animals' growth as a result of their poisonous end-products? (2) or, are the antibiotics, by suppressing the growth of some organisms, encouraging the growth of others that provide greater quantities of unknown nutrients? (3) or, is the suppression of bacterial growth making available a greater supply of the known vitamins and amino acids that are contained initially in the food?

Whether any of these answers have practical significance lies in the future. Many scientists believe that they will have, Dr. King said, although it is too early to predict how useful the results will be.

When antibiotic supplements are fed to turkeys, chickens and pigs, several groups report gains in weight in the range of 10% to 30% above the expected performance on "good rations." Preliminary tests are also under way with children.

It was disturbing to "pure minded" chemists to discover that feeding two to five percent of just ordinary farm dirt to pigs on test diets caused improvements in growth and health. Again it was surprising when research men testing the vitamin B₁₂ content of good clean suburban New York soil found that after stirring water with the dirt and filtering, the water had a vitamin B₁₂ content comparable to milk.

Science News Letter, November 25, 1950

least, Dr. Shumacker explained, because it shortens the period during which tissues are frozen and temporarily bloodless.

Recently the Association of Military Surgeons, meeting in New York, were reminded of other experiments showing the value of the anti-blood clot chemical, heparin, for treatment of frostbite.

One frostbite victim had been saved by heparin given when he reached the hospital after he had been lying in the street at least 14 hours in below freezing temperature with only low shoes and thin socks on his feet.

His feet and legs were ice cold up to the knee and remained so for five hours. Heparin was injected into his veins for five days. He developed considerable blistering, but was saved from any permanent loss of tissue or parts.

This and other cases were reported by Dr. Kurt Lange of New York when announcing their results with heparin treatment of frostbite in 1945.

Referring to this work at the meeting, Dr. Irving S. Wright of New York predicted that an anti-clotting drug which could be taken by mouth and be effective within an hour might be developed.

Use of the anti-blood clotting chemical prevents thrombosis or clot formation in blood vessels which ultimately leads to gangrene. The dangerous thrombosis does not occur early in frostbite, Dr. Lange and associates found, but anti-clot treatment must be started before this stage of thrombosis is reached.

Science News Letter, November 25, 1950

MEDICINE

"Dry Ice" Treatment Cures Most Acne

➤ A NEW treatment for acne involving the use of cakes of "dry ice," or carbon dioxide snow, was reported to the Southern Medical Association at its meeting in St. Louis.

Cures in from 70% to 86% of the patients, depending on the types of acne, were achieved, Dr. William L. Dobes of Atlanta, Ga., reported.

The cakes of dry ice are first dipped in a mixture of acetone and a liquid sulfur preparation marketed under the name of "Intraderm Sulfur." The cakes are then applied with moderate pressure to the skin of the acne sufferer.

The acetone dissolves the greasy film on the skin and allows the sulfur to be carried into the pores, Dr. Dobes explained. The sulfur has a drying effect on the oil glands of the skin and also has a bacteria-checking action, thus healing many infected pimples or sores.

The method is particularly useful, Dr. Dobes said, for young patients who should not be given X-ray treatments and for patients with whom X-ray and other treatments have failed.

Science News Letter, November 25, 1950

MEDICINE

Best Frostbite Treatment

Old treatment of rubbing frozen feet with snow increases chances of gangrene. Modern method is fast thawing with injections of heparin.

➤ IF the hundreds of soldiers and marines reported to have frozen feet during the latest advances in Korea followed the old treatment of rubbing snow or cold water on their feet, they may have increased their chances of getting gangrene.

But their chances of escaping this and consequent loss of toes, feet or legs should be good if they are gotten quickly enough to hospitals equipped to give them treatment with heparin.

This anti-blood clotting chemical and rapid thawing of frozen parts are the two latest methods reported for treatment of frostbite.

The fast thawing method is contrary to

medical views and practice as recent as World War II. Experiments showing that it gives best results in treatment of frostbite were reported only a year ago by Dr. Harris B. Shumacker of Indiana University Medical Center.

The ideal temperature for thawing, he and his associates found, is one slightly above body temperature. Too much heat is bad, they cautioned.

Their findings came from experiments in which the tails of mice were frozen. When the frozen tails were rapidly warmed, no gangrene set in, but it did when cold was applied.

The rapid thawing is effective in part at

GEOLOGY

Oceans Still Growing

Atmosphere also may be constantly fed by hot volatile gases escaping from interior of earth. Ocean basins sinking, making room for more water.

► THE OCEANS and the atmosphere may still be growing, fed by volatile gases escaping from the earth's interior.

This is the startling new theory of one of the nation's top geologists, Dr. William W. Rubey of the U. S. Geological Survey. But don't look for a world-wide flood tomorrow. The process is extremely slow. It has been going on since the dawn of geologic history, Dr. Rubey suggests.

Dr. Rubey presented his new concept of the origin of the oceans in his address as retiring president of the Geological Society of America.

Minerals and fossils in ancient rocks show that the composition of sea water and atmosphere has varied only slightly since early geologic time, the scientist said.

Some materials in the earth's sediments, air and oceans are much too profuse to be explained simply by the weathering of rocks, he said. These include water, carbon, chlorine, nitrogen and sulfur. They are among the volatile elements which escape as molten rock from the earth's core rises and falls.

The relative amounts of these "excess" volatiles correspond closely enough to those in gases from volcanoes and hot springs, Dr. Rubey said, to suggest that the ocean and atmosphere may have come from such gases

Older geologic theories make the earth originally a mass of molten or gaseous material. If this were true, Dr. Rubey said, the "excess volatiles" probably condensed from a primitive atmosphere.

But advancing knowledge in seismology and geochemistry, he said, "makes it increasingly difficult to retain the concept of an originally molten earth."

If the oceans and the air came from the interior of the earth, on the other hand, it would imply that their overall volume has grown steadily over the ages.

This is backed up by geologic evidence, Dr. Rubey said. The ocean basins have been progressively sinking, necessarily meaning a greater amount of water to fill them.

Science News Letter, November 25, 1950

GEOLOGY

Old Man River Is Real Dirt-Mover

► ENOUGH mud and ooze to build a dike five miles across and tall enough to reach the moon has been deposited in the Gulf of Mexico during the past 125,000,000 years, Dr. Grover E. Murray of Louisiana State University told the Geological Society of

America meeting in Washington

This amount of sediment, amounting to 1,500,000 cubic miles with a weight of 15,620,000,000,000 tons was mostly removed from the surface of the central United States by rivers.

Science News Letter, November 25, 1950

On This Week's Cover

► AMONG the most striking of all scientific photography is that of the geologist. The grooves and indentations shown on this week's cover of SCIENCE NEWS LETTER are not a close-up of a fossil, but a picture taken high in the sky, looking straight down at Zion National Park's majestic canyon in southwestern Utah. Dead center is a U-turn in the gorge called "Angel's Landing." To its right is the cup-like depression known as the "Great White Throne." Taken from this height (14,000 to 18,000 feet) the precipitous walls of the gorge are lost, but in their place is a sweeping panorama of the giant folds and water-cut canyons which make Zion Park a classic of geology. The photograph is part of a University of Illinois collection shown at the annual convention of the Geological Society of America in Washington by Dr. Harold R. Wanless, Illinois professor of geology.

Science News Letter, November 25, 1950

AERONAUTICS

Liferaft for Plane Crew Inflates Automatically

► "CIRCUS-TENT," a 20-man liferaft for the crewmen of a ditched plane, is automatically inflated by means of a line attached to the compressed gas tank in the thrown-out raft and hooked to the plane.

It is called a floating circus tent because of its appearance when in the water, particularly with its protecting canopy in position. The raft itself has no top or bottom, so it makes no difference which side is uppermost when it hits the water.

The raft is made of two rubberized nylon floatation tubes which resemble giant automobile inner tubes. The floor of the raft is between these tubes. Both sides are alike, and whichever one happens to be on the top is used for the passengers.

This new liferaft was developed in Dayton at the Wright-Patterson Air Force Base and 400 have been ordered from the Air Cruisers Company, Clifton, N. J. They are for use on planes of the Military Air Transport Service. The liferaft comes complete with canopy, radar reflector and accessory kit, all wrapped in a compact package three feet long and half that in width.

Particular features of the raft include its sturdiness and buoyancy. It can support more than 5,000 pounds without sinking and has survived tests in winds up to 60 miles an hour.

Science News Letter, November 25, 1950



LIFE RAFT—This 20-man floating refuge for downed airmen is dry and highly buoyant. The canopy, raised here to give ventilation, can also be lowered to keep out rain or sun.

MEDICINE

Old People "Revitalized"

Men and women from 65 to 85 years of age given increased strength and alertness, more interest in life by suitable diet and hormone treatment.

➤ A METHOD of "revitalizing" old people, from 65 to 85 years, was reported by Dr. William B. Kountz and associates of Washington University School of Medicine at the meeting in St. Louis of the Gerontological Society.

The method is one of revitalizing rather than rejuvenating, Dr. Kountz emphasized, though he admitted that to some extent in some persons rejuvenation was also possible. Elderly women, for example, have a return of monthly menstrual bleeding under the revitalizing treatment. But their ovaries have not yet been revitalized though studies on this are now in progress.

Mental alertness and increased physical strength, so that the oldsters are more interested in life, more cooperative, able to get about and even in some cases return to earning a living, are the chief changes brought about so far by the revitalizing treatment. Certain organs, such as the uterus and genital organs, can be revitalized. The bodies of the old men and women become healthier and in general function more like those of younger persons.

The revitalizing method consists in giving a suitable diet and such hormones, or gland products, as are needed. On the diet side, protein foods, the meat, milk, eggs and fish, group are emphasized. At the same time the oldsters are given the male hormone testosterone, to make sure their aging bodies can utilize the protein.

The sugar and starch burning mechanism is revitalized by giving certain adrenal gland hormones or by insulin if necessary

Thyroid gland hormone or iodine is given, according to the old person's needs. Cortisone and female hormones are also used and in some cases certain hormones from the pituitary gland in the head are given.

Some 250 old men and women at the St. Louis City Infirmary have been getting the revitalizing treatment, but so far no attempts have been made to do a complete revitalizing job on any one person. Some have gotten one part of the treatment and some another, in the research to find best methods of revitalizing them.

The point of the research, Dr. Kountz said, is to show that revitalization can and does take place through proper application of scientific principles.

Science News Letter, November 25, 1950

VOLCANOLOGY

Paricutin Volcano Losing Vigor of Youth

➤ THE VOLCANO Paricutin, born in a Mexican field in February, 1943, is slowly losing the vigor of its youth.

Continual eruptions are still going on, but they were slightly less intense and less frequent by the end of 1949 than in former years. Carl Fries, Jr., chief of the U. S. Geological Survey's Mexican office, has reported. There were longer periods between blasts from the volcano's crater, and the amount of volcanic ash shot into the atmosphere is declining. Mr. Fries and a Mexican geologist, Celedonio Gutierrez,

write in the publication of the American Geophysical Union.

Paricutin, although a small volcano, has been studied in greater detail than any volcano in history. Constant observations have been made by scientists since the time the vent opened in the earth and the mountain began to grow.

Science News Letter, November 25, 1950

Coal constitutes about 95% of America's estimated reserves of fuel

SCIENCE NEWS LETTER

VOL. 58 NOVEMBER 25, 1950 No. 22

44,900 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W., Washington 6, D. C., North 2255 Edited by WATSON DAVIS

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00, 3 yrs., \$14.50, single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925, 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N. Y. C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago STA 2-4822

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PHYSICS

Largest "Deep Freeze"

New "cryostat," with capacity of 15 cubic feet, now in operation at Massachusetts Institute of Technology. Works by compressing, cooling and expanding helium.

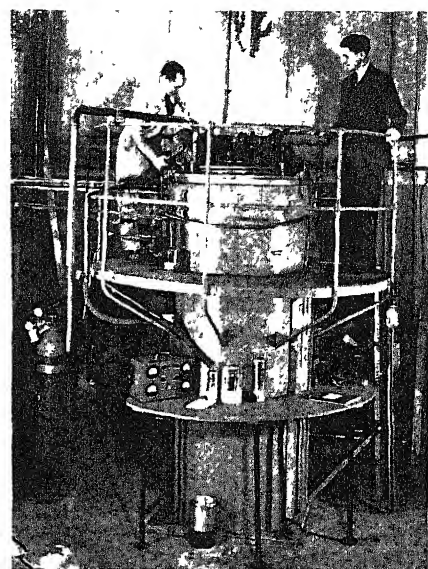
➤ NEW THEORIES relative to the peculiar behavior of metals at temperatures near absolute zero are expected with the use of the largest "super-deep-freeze" yet constructed. It is now in operation at the Massachusetts Institute of Technology.

It is what scientists call a "cryostat," and was designed and built by Dr. Samuel C. Collins, of the MIT staff. He also developed smaller types of low-temperature apparatus now used by several institutions for studying the behavior of materials at temperatures some 450 degrees below zero on the Fahrenheit scale. Absolute zero is approximately 460 degrees below zero, but this temperature has as yet never been reached.

This new equipment has a capacity of 15 cubic feet and can cool its contents to 452 degrees below zero Fahrenheit. It can hold them at that temperature indefinitely. It is based largely on the principles employed by Dr. Collins in his smaller cryostats. It operates by compressing, regenerative cooling and then expanding helium gas until a portion of the gas turns into a liquid. This takes place when the helium is just 7.5 degrees above absolute zero.

The new machine, Dr. Collins states, fulfills for the first time the need for a large refrigerated space in which heavy equipment can be cooled and studied at lower temperatures than ever before.

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GIANT "DEEP FREEZE"—Drs. Samuel C. Collins and Robert P. Cavileer of MIT are shown here with the newly completed cryostat for very low temperature research.

MEDICINE

Link Virus to Cancer

Evidence reported that Hodgkins' disease is caused by filterable virus. Research continuing to learn more about the agent and how it may be attacked.

➤ SCIENTISTS are coming close to proving that some human cancers are caused by viruses.

For many years it has been possible to induce cancers in experimental animals with certain viruses; and it has long been suspected that some human tumors might also have a virus origin.

Now, Dr. Warren L. Bostick, pathologist in the University of California School of Medicine, San Francisco, has reported (PROCEEDINGS OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY) the first strong evidence that Hodgkins' disease, a consistently fatal form of cancer, is caused by a virus.

Hodgkins' disease long has been suspected to be of virus origin, because it so closely resembles an infectious ailment. It is accompanied by recurring fevers and swelling of gland and lymph tissue. But until now efforts to pin the disease agent down have been inconclusive.

In several ways Dr. Bostick has demonstrated that Hodgkins' disease tissue contains a virus. Extracts of tissue killed a significant number of chicken egg embryos—the anticipated effect of a virus.

The extract also demonstrated the interference phenomena characteristic of viruses. In this case, influenza virus could not get a foothold in fertile chicken eggs

already injected with Hodgkins' disease extract.

Finally, the scientist showed that the agent in the extract is filterable. That is, the extract was passed through a filter which is designed to catch all infectious agents but those the size of viruses. Portions of the extract passed through the filters still retained their lethal qualities.

The scientist is continuing work directed at learning more about the agent, its action, and how it may be attacked.

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ENGINEERING

Control of Corrosion Necessary in Pipelines

➤ THE CONTROL of corrosion in petroleum pipelines, both on the inside and the outside, was a leading subject of discussion at the meeting of the American Petroleum Institute in Los Angeles. Unless protective measures are taken pipes carrying crude oil and petroleum products may have a short life.

Internal corrosion is a major problem in producing areas where crude oils with a high content of hydrogen sulfide are prevalent, the Institute was told by J. K. Alfred, Shell Pipe Line Corporation, Colorado City,

Texas. One "hot spot" for internal corrosion is the relatively new oil fields in the Permian Basin of West Texas. In this area plastic and cement linings are used to prevent corrosion.

A method of cleaning a pipeline already in use and coating the inside with various vinyl and polyester plastics was described. The method involves the use of two separated rubber plugs which are driven through the pipe by compressed air. They clean the pipe by friction or pressure and coat it by a wiping action.

For outside protection, new developments in coatings and electric cathodic methods were discussed by Carlton L. Goodwin, Portland Pipe Line Corp., Portland, Me. Coating alone has a limited effective life, he said. Cathodic protection with an electric current has been effective on bare pipe, but the cost over a long period of time may be excessive.

Effective coatings must retain good electrical resistance underground and have the lowest solubility in crude oil or crude-oil products. He indicated that hot-applied coal-tar enamels are best.

Direct current supply at low voltages is required for the application of cathodic protection. Various methods used to obtain the current were described. The present principal sources are galvanic anodes and rectifiers which convert power-line currents to direct current. The use of galvanic anodes has limited applications. Dry-type rectifiers have proved most successful and dependable.

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GENERAL SCIENCE

Squeezed Out of College

Colleges caught between reduction in aid to veterans and loss of draft deferment. Additional threat seen in proposed Universal Military Service plan.

► THE NATION'S colleges are being caught in a giant nutcracker which is squeezing thousands of students out of their new dormitories and classrooms. One arm of that nutcracker was revealed by figures from the U. S. Office of Education which shows a drop of 33% in the number of veterans attending college this year.

The figure has gone down from 856,000 veterans last year to 575,000 this year.

The other arm of the nutcracker will probably be brought to bear next June when this year's male freshman class members, numbering 319,000, face review of their draft deferment status.

Approximately 30%, or 95,000, will be exempted because of physical or other reasons. If a plan supported by Draft Director Lewis B. Hershey to take away deferment from the bottom half of the freshman class is adopted, the nation's colleges will lose upward of 100,000 men from next year's sophomore class.

The large majority of them will be 19—lower draft age limit—next year.

The gradual but sure disappearance of

G. I Bill financial support as the veteran population uses up its rights contributed largely to this year's drop in total enrollment to 2,295,000 from 2,456,000 last year.

However this fall-off in the number of male students at the nation's colleges is a small threat to them compared to what will happen if Universal Military Service in its most drastic form is approved by the newly elected Congress.

Instead of approximately 300,000 male freshmen and 200,000 female freshmen expected next year, there would be only about 90,000 males—those who would be deferred from UMS for other reasons. This would occur if all physically qualified male 18-year-olds were required to enter military service for a period of one to two years as many officials are now suggesting.

All kinds of higher education institutions have smaller student bodies this year, except theological seminaries and Negro institutions. Negro colleges held their own in total student bodies and the entering freshman class was actually 3.1% larger than last year's.

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Forces. Also, the board would have the power to review requests from the Armed Forces to find out whether they were asking for the proper kind of people.

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GENERAL SCIENCE

NSRB Should Decide Deferment Policy

► THE National Security Resources Board, rather than the Defense Department or any other agency, should determine how many men should be deferred to go to college, Dr. Arthur S. Adams told Science Service.

Dr. Adams is president-elect of the American Council of Education, president of the Association of Land-Grant Colleges and Universities and president of the University of New Hampshire.

"There must be maintained a trickle of young men into the colleges and universities whatever system of induction into the armed forces is set up," Dr. Adams maintained. "The NSRB is the logical agency to decide how large a trickle is necessary to provide trained men for the defense of the country."

Dr. Adams, in Washington for the 64th annual convention of the land-grant colleges organization, thus put himself in direct opposition to Harvard President James B. Conant's program of universal military service for everybody—including the physically handicapped—at age 18.

Dr. Adams believes that every young man should serve at some time. He refused to be specific as to how this would be accomplished, pointing out that there is much confusion both in Washington and among educators on the subject.

Dr. Conant's proposal for "universal" Universal Military Service, shortly to be announced in a national magazine, was the subject of much discussion at the convention. Most college presidents present tended to look upon it with considerable skepticism, primarily because it makes no provision for the continuous college training of young men of draft age.

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GENERAL SCIENCE

Registry of Scientists

Four leading scientific bodies agree on recommendations for compulsory registration and drafting if necessary. Would defer college students.

► FOUR of the nation's top scientific bodies, at the request of the National Security Resources Board, have agreed on recommendations which would provide for the compulsory registration and drafting, if needed, of up to 600,000 male scientists, technicians and engineers, Science Service has learned.

The scientific societies, which were asked last September to draw up recommendations on how to handle scarce scientific manpower, are the American Institute of Physics, the American Chemical Society, the Engineers Joint Council and the National Research Council.

The four societies, in their joint statement, strongly advocate deferring some men from service to go to college. They support the principles of a plan advocated by Selective Service Director Lewis B. Hershey which would have all high school seniors taking a college aptitude test. Only the 15% or 20% who achieved high marks

on this test would receive deferments to go to college.

This puts the scientific groups in opposition to the principles of all-out Universal Military Service as advocated by President James B. Conant of Harvard and some officials of the Defense Department. However, the scientific groups recommend that those who do receive deferment for college training be among the first to be called into the Armed Forces when they have finished college, regardless of whether they have passed the draft age.

Under the plan, all male scientists, technicians and engineers would be required to register with a new agency—perhaps to be called the National Scientific Personnel Board. The board would have the power to fill the needs of the Armed Forces for scientific manpower from this registration list. Men would be called up on an individual basis to fill individual jobs in the Armed

GENERAL SCIENCE

Military Service Urged For All 18-Year-Olds

► DR. James B. Conant, president of Harvard University, will shortly advocate two years of Universal Military Service for every young man when he reaches 18—whether or not he is physically handicapped, Science Service has learned.

He further will recommend that the nation's young manhood perform this service "at a low rate of pay." Physically handicapped young men, he will say, should be enrolled to perform those services for the nation which it is possible for them to perform.

Dr. Conant's statement—to appear as an article in a forthcoming issue of a national magazine—is expected to raise a storm of controversy in scientific, educational and government manpower circles. Copies have been circulated among some of these people already and discussion is widespread.

It is in direct conflict with a plan sponsored by Selective Service Director Lewis B. Hershey for deferment of some college students. This plan, which has received much support from scientists and educators, would establish a nationwide college aptitude test. Young men who received high marks on this test would be permitted to enter college. They could stay there so long as they remained in the upper portion of their class.

Another college president, Dr. Leonard Carmichael of Tufts, Medford, Mass., told

Science Service that he could not approve Universal Military Service at 18 for everybody. Dr. Carmichael was in charge of the National Scientific Roster during the war, and thus kept track of all scientific, technical and engineering personnel.

"If we have UMS," said Dr. Carmichael, "all individuals should serve at some one time in their lives. However, a certain segment of young men, chosen on the basis of a test and state quotas, should be given the option of going to college to receive training."

"If everybody is drafted at 18," he went on, "the men who go to college afterwards may be subject to a second draft and a second period of service. This is likely because the Armed Forces will need college-trained men such as doctors, scientists and engineers."

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ANTHROPOLOGY

How Ancient Is American?

Tools found in gravel pit with 750,000-year-old fossils but scientists are divided in opinion as to whether human artifacts are equally old.

➤ DID man first reach America from Asia 750,000 years ago, instead of a mere 10,000 to 12,000 years ago?

Scientists disagree vehemently on the evidence of a sand and gravel pit near Frederick, Okla. There, amidst the remains of long-extinct animals, ancient flint and stone artifacts, tools of human habitation, have been found.

There is sharply divided opinion on whether the tools and animal fossils come from the same geologic age, Dr. Grayson E. Meade of Texas Technological College said in a paper before the Paleontological Society of America meeting in Washington.

Without entering the controversy, Dr. Meade described fossil animal remains found in the Holloman sand pit. During Aftonian time, close to the beginning of the Ice Age, the area was the home of elephants, wild camels, and lions found today only in Africa and Asia.

The age of these fossils has been definitely established as about 750,000 years.

The Texas geologist claimed no knowledge of the authenticity of the human evidence in the Holloman pit.

However, he said that those who believe the artifacts and animal fossils were buried in the same dim age consider the Holloman site "by far the oldest known evidence of man in North America."

It has been generally accepted by anthropologists that North and South America were peopled by migrants from Asia who arrived about 10,000 years ago, Dr. E. H. Sellards, director of the Texas Memorial Museum, said in another paper.

Excavations during the past two years in an ancient New Mexico lake bed have turned up a new plains culture even older than the shadowy "Folsom Man" discovered in the 1920's, Dr. Sellards said. To this new culture has been given the name Llano. Implements and weapons made of bone and stone have been found, he said, which suggest that these people hunted elephants.

The geologic layer in which these artifacts were found suggests that the Llano culture is approximately 10,000 years old, dating from the retreat of the last North American ice cap.

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MINERALOGY

Petalite Is Promising For Rocket Engines

➤ A MINERAL called petalite is producing new industrial ceramics able to stand up under temperatures as high as 2192 degrees Fahrenheit.

Studies of the quartz-like material, known for over a century but never utilized, have been accelerated with the advent of jet and rocket engines, John D. Clark, a Philadelphia engineer, reported.

Such engines, which must withstand towering temperatures, brought a bottleneck in materials able to shrug off a phenomenon known as "heat shock." Petalite, containing lithium, aluminum and silicates, was discovered to be even tougher than pure fused silica in its heat shock properties.

Mr. Clark predicts wide use of the long-

neglected mineral, ranging from heat-resistant cooking dishes to the fittings used in ceramic firing kilns.

Lithium was discovered from petalite in 1818. There are deposits in Sweden but they are not extensively worked. In the late 1930's and early 1940's, huge blocks of petalite were found in quarries in South West Africa. There are no commercial deposits in the United States, and the mineral has to be shipped in from Africa.

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MINERALOGY

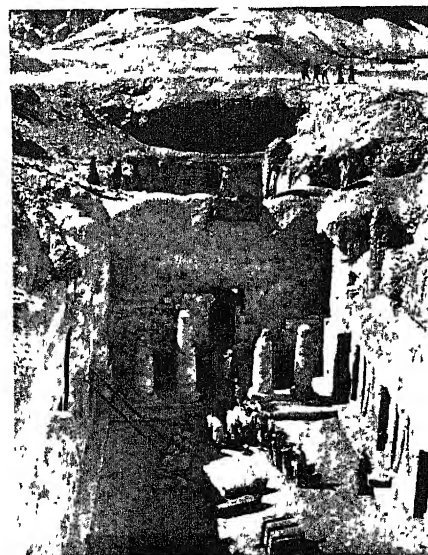
Big Sparkling Stones No Good for Necklace

➤ LARGE, sparkling stones—false gems that rival emeralds or sapphires in their color and luster, are now on exhibit at the U. S. National Museum.

The collection was gathered over many years from the copper-mining district of the former German southwest African region. Except for their softness, these crystals might well become supergems for decorative necklaces and pins.

The crystals, of lead or copper mixed with carbon or sulfur, are formed from such minerals as lead carbonate, carbonated copper and copper silicate. The minerals are formed by percolating waters and occur in cavities in the upper layers of copper deposits.

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ROYAL TOMB—Burial palace of the Prince of Thebes as it looks today. Openings on right and left lead down to the burial chambers of the "Mentemhet family." Note how covering layers have accumulated above. The finding was made near the famous Valley of the Kings near Luxor, Egypt.

PALEONTOLOGY

Find Bone of Smallest Mammal in America

➤ THE SMALLEST mammal ever known in America has been identified from a three-sixteenth-inch piece of jawbone found in Wyoming. The animal was a tiny shrew which lived 55,000,000 years ago.

The discovery was announced by Dr. George G. Simpson of the American Museum of Natural History and Dr. Paul O. McGrew of the University of Wyoming, co-leaders of a fossil-hunting expedition this summer in the Green River Basin.

Other fossils brought back in an extensive collection include the remains of opossums no larger than today's house mouse, birds, fish and ancient animals that crept.

These creatures lived during an age when the West was also inhabited by huge mammals, and there were fresh water lakes over vast areas which are now rangeland.

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ARCHAEOLOGY

Evidence of Vikings Found on Shetland Islands

➤ THOSE tall, fair-haired Vikings, who long ago braved the Atlantic in their wooden ships, went ashore on many islands. Evidence of their arrival on the Shetland Islands north of Scotland has now been established.

Word has just been received in the United States from J. R. C. Hamilton of remarkable archaeological finds at Jarlshof.

Beneath the grassy slopes of a mound lay the debris of village settlements occupied for a period of at least 2,000 years. The earliest levels, resting on natural sand at the base of the mound, date to a time when these islanders were leading a Stone Age existence; the latest, to the period of Viking occupation beginning in the ninth and tenth centuries A.D.

The excavation of the Viking settlement, begun in 1934 by Dr. A. O. Curle, was discontinued during World War II. During this period nine houses with associated enclosure walls, passages and paved yards were uncovered. The dwellings consisted of rectangular buildings of Norse type (50 to 80 feet long), the majority being built down the landward slope of the mound with their west gables facing the sea. Smoke from the central fires escaped through a hole in the roof. There were also apertures to admit light.

During 1949-1950 the earlier levels revealed that a flourishing Viking community, probably from the More and Agder districts of Norway, was established as early as 800-850 A.D. Finds from the hearths and kitchen middens include fragments of beautifully ornamented bone combs, animal pins, spindle whorls, loom weights, iron nails, fishhooks, sickles and numerous frag-

ments of steatite or soapstone bowls.

Life appears to have been predominantly peaceful. From the quantities of fish bones and fishing tackle it is clear that they were industrious fishermen. They must also have been engaged in quarrying and transporting steatite vessels from farther up the coast. The inhabitants of Jarlshof appear to have taken little part in Viking raids during the early period, only a few objects suggesting contact with the south. In later times there was connection between the Norse colonies in Iceland and Greenland.

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PSYCHOLOGY

Mental Health Group Approves Comic Books

➤ COMIC BOOKS help children learn to read, give them a chance to keep up with the pace of our fast-moving world and are not responsible for juvenile delinquency.

If a child has nightmares after reading comic books, it is a good thing, because it will draw attention to his real anxieties and difficulties in adjustment which are merely brought to the surface by the comic book diet.

This praise of comic books comes from the National Association for Mental Health. In fact, the association is going to bring out a comic book of its own.

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AERONAUTICS

Landing System Antenna Unaffected by Snow

➤ INSTRUMENT landing systems now in use at major airports will be little affected by deep snow when equipped with new antennas developed by the Civil Aeronautics Administration.

The antennas of the instrument systems, used in foggy weather to permit planes to make safe landings, send out the electronic glide paths which properly equipped planes follow down to the runway. To produce the path in space leading down to the landing strip, the antennas make use of radio waves reflected from the ground near the station.

When snow changes the ground level, the shape of the glide path is affected. The change may be as much as a whole degree from the desired two to three degree slope. A two-foot snow will cause a change in the glide-path provided by the new antenna of only about one-tenth of a degree.

The new device is called a "null reference" antenna. The old systems can be readily modified for its use. It utilizes two glide slope antennas on the vertical pole which supports them. The instrument landing systems at all airports controlled by the CAA will soon have the new equipment.

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MEDICINE

Polio Paralyzes In Cool Climates

➤ THE POLIOMYELITIS virus paralyzes oftener in cooler climates than in warmer ones, Dr. M. Lloyd Aycock of Harvard Medical School declared in a report to the National Foundation for Infantile Paralysis.

"The reason for this is not understood," he said "It might well lie in some fault of bodily adaptation to the wider variations in cooler climates."

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MEDICINE

Medical Education Believed Inadequate

➤ DECLARING that current techniques of teaching medicine "have become inadequate even for the objectives of 1910," the \$63,000,000 Commonwealth Fund has announced gifts during the past year of \$693,370 for research in medical education. This was the largest share of a total disbursement of \$2,001,833.31. The announcement is made in the Fund's 32nd annual report.

"The first two years of medical teaching are characteristically split into discontinuous fragments and the student is given little help in putting them together," the report charges. "In the clinical years, too, instruction is pieced together out of the contributions of independent departments, which may differ as much in their philosophy as in their techniques."

"Only by the grace of God (which rarely becomes operative until after the young doctor has his medical degree, and not always then) does the student of medicine learn today to think about medicine as a whole," the Fund's report continues.

Largest share of the appropriation for medical education research has gone to Western Reserve University School of Medicine, Cleveland. This school received \$269,400 with an additional \$164,000 on tap, to aid it in working out and putting into effect methods of rebuilding the entire medical curriculum.

The report declares the Commonwealth Fund, founded in 1918 by Mrs. Stephen V. Harkness, intends to devote more of its money in the future to backing experiments looking to the integration of community health care and its development in new directions.

The Fund also donated \$550,845 in support of public health, \$380,002 for medical research and \$202,807 for fellowships for British students and civil servants.

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MEDICINE

Most Expensive Meat Costs \$40 Per Pound

➤ **HOUSEWIVES** will shudder at this. A special part of hog brain now costs \$40 a pound.

This most expensive of any meat animal tissue is the tiny pituitary gland buried at the base of the hog's brain. From it scientists extract ACTH, potent drug which can be used like cortisone to treat arthritis and various other ailments.

Demand for ACTH has boomed the hog pituitary price to the present \$40 a pound from \$8 a pound, the cost a little over a year ago when Armour and Company started making ACTH in volume.

Armour's ACTH, marketed under the brand name of Acthar, is now available generally to physicians or to patients on physicians' prescription. It is no longer limited to patients in hospitals. And while the cost has not been reduced, patients will in a sense be paying less for treatment because doctors have found that very much smaller doses are as effective as the large ones originally used when the drug was first tried.

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ICHTHYOLOGY

"Death Fence" Ridding Lakes of Sea Lamprey

➤ **SYSTEMATIC** electrocution of the sea lamprey has begun in the Great Lakes.

A Fish and Wildlife Service official said the first experimental "death fence" in the government's lamprey war is now in operation across Carp Lake River at the northern tip of Michigan's lower peninsula.

An eel-like killer fish with a suction cup mouth, the sea lamprey has virtually destroyed lake trout in the Great Lakes and is now attacking other commercially valuable fish such as the whitefish and chub.

Unless stopped, Fish and Wildlife director Albert M. Day has warned, the lamprey may destroy the entire Great Lakes fishing industry. To stop the parasite, scientists of the Cook Electrical Co. of Chicago were asked last spring to design electronic devices which could wipe out the lamprey.

The electrocution screen now in operation is the first weapon. Still in the laboratory is another device which the scientists hope will single out the lampreys from other fish by underwater sound or light rays, then kill them by electrical means.

The device now being used in Carp Lake River kills all fish, passing through it. But young lamprey "neophytes" on their way from upstream mud banks to the open lakes

are virtually the only fish running the streams in the winter.

For these potential marauders, it will be a hot winter in cold country. The electrical fence gives the young lampreys no warning, killing them almost instantly when they reach it.

Before the water warms in the spring and other fish come upstream to spawn, the electrical fence will be shut off. By that time, Cook scientists are hoping to have ready another death ray which will scare away worthwhile fish while lampreys are being killed, and hold lampreys at a sort of underwater stop light while other fish move on upstream to spawn.

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MINERALOGY

Discover New Deposit Of Rare Mineral

➤ **PREVIOUSLY** known to exist in only two places in the world, a third deposit of the rare mineral brazilianite has been announced.

Crystals of the clear, slightly greenish mineral were found recently in old mine cuts in northeastern Brazil by Dr. Joseph Murdoch, professor of geology at the University of California at Los Angeles.

Before this discovery it was known to exist only in south central Brazil and in New Hampshire. Tiny crystals of the mineral were located in old tantalite and beryl mines in the state of Paraíba, Brazil, which had been active during World War II.

Dr. Murdoch identified the mineral on his return to the United States by its crystalline form, using the X-ray powder pattern method.

Brazilianite is more of a geological curiosity than anything else. Because of its extreme scarcity it has no economic or industrial use.

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MEDICINE

Head Tumors in Babies Blamed on Instruments

➤ **INSTRUMENTS** used to deliver babies are to blame for soft tissue tumors developing at the back of the head in newborn infants, Drs. M. D. Ingram, Jr., and W. M. Hamilton of Vanderbilt University School of Medicine, Nashville, charge in a report to *RADIOLOGY* (Oct.), special medical journal published by the American College of Radiology.

These tumors consist of a blood clot underlying several layers of the scalp. Medical name for the condition is cephalohematoma. It occurs "significantly" more often in babies delivered by forceps, the Nashville physicians reported.

They found the condition developed in 126 out of 7,563 deliveries between 1944 and 1949.

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AGRICULTURE

Dye Seeds Yellow To Save from Birds

➤ **DYEING** forage grass and legume seeds a brilliant yellow and coating them with poison will protect them from birds, rodents and ants.

Dr. Walter E. Howard of the University of California's College of Agriculture, reports that this technique is especially useful when forage grass and legume seeds are scattered over burned brushlands to provide a quick cover to prevent costly erosion or floods.

In experiments, birds have consistently refused the yellow-dyed seeds. Rodents don't like the taste of the poison. And colonies of harvester ants were exterminated within a day or two when the seeds were treated.

The dye used is called National Brilliant Yellow S. P. The poison, compound 1080—highly toxic, with no known antidote—is available only to county agricultural commissioners and licensed pest control operators. Neither the dye nor the poison has appreciably affected growth of the seed, said Dr. Howard.

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MEDICINE

Anti-Clot Chemicals Are Given Locally

➤ **A METHOD** of cutting down on the danger of hemorrhage and improving results in some serious operations has been reported by physicians in the University of California School of Medicine.

They have devised a way of using anti-clotting chemicals locally, in areas near the site of operation. At the present time these chemicals, heparin and dicumarol, are given in such a way that they influence the whole blood stream. While this is very effective in preventing the formation of clots which might plug up an artery and cause death, it also raises the problem of hemorrhage.

The physicians insert a polyethylene plastic tube into the artery near the site, and introduce heparin into the artery slowly and steadily during and after the operation. Smaller quantities of the drug are needed, the blood in the danger area is kept fluid, and the danger of massive hemorrhage is reduced.

The method was worked out first on animals, and is now being used successfully on human patients. It is especially useful in operations on the extremities to remove blood clots which may threaten loss of the limb.

The work was reported by Drs. Edwin J. Wylie, Richard E. Gardner, Robert Johansen, and H. J. McCorkle, all of the California institution. (*SURGERY*)

Science News Letter, November 25, 1950

ASTRONOMY

Winter Arrives

With the coming of cold weather, the evening skies contain bright array of constellations surrounding Orion, the warrior. Brightest are Sirius and Procyon.

By JAMES STOKLEY

► WITH the arrival of December we approach the formal beginning of winter, which occurs this year on Dec. 22 at 5:14 a.m., EST. This is the moment of the winter solstice when the sun, which has been moving through the sky in a southerly direction since June, reaches its southernmost point. Then it starts northward again—with its promises of another spring and summer.

In the evening skies, too, the coming of winter is reflected with the appearance in the east of that bright array of constellations surrounding the figure of Orion, the warrior. These are shown on the accompanying maps, which give the appearance of the skies at about 10:00 p.m., your own kind of standard time, on Dec. 1; 9:00 p.m. at the middle of the month; and 8:00 p.m. as January arrives.

Southeastern Sky Crowded

Only a glance at the map of the southern half of the sky reveals that the left-hand side seems quite crowded compared to the region to the right. And this is no illusion, for the southeastern part of the December sky does contain an unusually large number of bright stars. In this area, for example, shown near the horizon, is the brightest of all the night-time stars: Sirius, the dog-star, in the constellation of Canis Major, the great dog. The lesser dog, Canis Minor, is higher and farther east, with the star Procyon, another of the first astronomical magnitude.

But it is above Canis Major that we find Orion, one of the most conspicuous constellations in the sky. The three stars in a row form the warrior's belt. Still higher

is Betelgeuse and another star to the right, called Bellatrix, which marks his shoulders. Rigel, on the opposite side of the belt, is in one leg, according to the pictures drawn around the stars on the old celestial maps.

Above Orion we find Taurus, the bull, with first-magnitude Aldebaran still higher and a little to the left stands Auriga, the charioteer, which contains the brilliant star Capella. And below Auriga are Gemini, the twins, with Castor and Pollux

Jupiter Only Planet

Though the southwestern part of the sky is poorer in bright stars, it does supply the only planet now prominent. This is Jupiter, even brighter than Sirius. It is seen in the southwest as darkness falls at the beginning of December. Then it sets in the west around 11:00. By the end of the month it will set about 9:00 p.m.

Also visible, though much fainter, is the planet Mars. This planet sets about two and a half hours after the sun and is not shown on the maps. It is in the constellation of Capricornus, the sea-goat, which is next to Aquarius.

The planet Venus has now moved into the evening sky, though it will not be until the end of December that there will be any chance of getting a glimpse of it. Even then it sets less than an hour after the sun, and will not be easy to locate. However its great brightness, many times that of Jupiter, may enable one to pick it up near the southwestern horizon as darkness begins to fall. One should keep watching for it, however, for by the end of January it will be readily found. And during the late winter and spring it will be conspicuous in the evening sky.

Still another planet, Saturn, in the con-

stellation of Virgo, the virgin, may be seen later in the night. At the beginning of December it rises in the east in early morning, and before midnight at the close of the month.

In classifying the stars and other heavenly bodies by their brightness, astronomers make use of "magnitudes." Most of the brightest stars are of the first magnitude, though two—Sirius, the dog-star, and Canopus, which is visible only from more southerly countries than most of the United States—are even brighter and need a magnitude still lower than the first. Thus these are given negative numbers. Sirius, for example, is of magnitude minus 1.58 and Canopus of minus 0.86.

The difference between first and second, or between any two magnitudes, is in the ratio of 2.51. This seemingly curious figure was chosen because a difference of five magnitudes is a difference of brightness of exactly 100 times.

While the greatest telescopes permit recording stars as faint as the 20th magnitude, it is usually considered that the sixth is about the faintest that can be seen with the unaided eye. Of course, this is merely an approximation. A person with particularly keen eyesight, and on a night when the sky is unusually dark and clear, might be able to see down to the seventh magnitude or perhaps even fainter.

Hard To See in City

On the other hand, from a large city or its environs it is difficult to see stars of the fourth magnitude. Stars down to that faintness are shown on our maps. To show fainter ones would crowd the maps unduly and not greatly help our readers, since many of them are located where such stars could not be seen in any event.

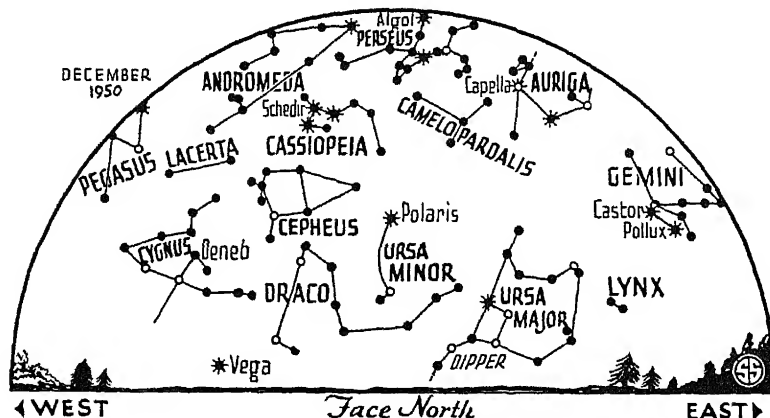
However, on the southern chart for December we have indicated the position of an object that is considerably fainter. It is in the constellation of Gemini, the twins, close to the edge of the map. It is marked

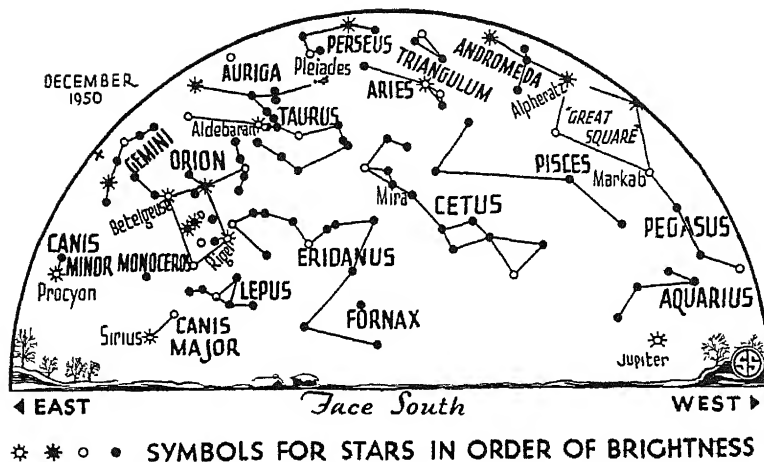
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in the form of an X and shows the position of the planet Uranus, to which this earth this month makes its closest approach of the year. At that time our planet and Uranus will both be in the same direction from the sun and we will be separated by only 1,663,000,000 miles, considerably less than the 1,965,000,000 to which it can recede from us.

At that time Uranus is closest, on Dec. 29, its magnitude is 5.8. It changes little through the month, however, so that a person with average good eyesight and a clear dark sky should be able to find it. A small telescope or a good pair of binoculars will help one to pick it up. Through a large enough telescope it will be seen to have a distinct disk, unlike the stars which appear as mere points of light whatever telescopic power is used.

It was this that enabled the great English astronomer, William Herschel, to discover Uranus on March 13, 1781. Then, as now, it was in the constellation of Gemini. He realized that it was not a star but thought it to be a comet. This was hardly surprising because no astronomer before had ever discovered a new planet. Later, however, it was shown to be a planet, revolving around the sun, at an average distance of 1,785,000,000 miles every 84 of our years. Its diameter is about 32,000 miles, or just four times that of the earth, though it revolves more

rapidly than our home, turning once in less than 11 hours.

Uranus has five "moons" or satellites.

Celestial Time Table for December

Dec.	EST	
2	11:22 a. m.	Moon in last quarter
5	11:11 p. m.	Algol (variable star in Perseus) at minimum brightness
8	8 00 p. m.	Moon nearest, distance 221,700 miles; Algol at minimum
9	4 28 a. m.	New moon
	3:28 p. m.	Moon passes Venus
11	4:49 p. m.	Algol at minimum
	8 19 p. m.	Moon passes Mars
12	early a. m.	Shower of meteors radiating from constellation of Gemini
14	7 43 a. m.	Moon passes Jupiter
15	10 00 a. m.	Mercury farthest east of sun
16	12:56 a. m.	Moon in first quarter
21	9:00 p. m.	Moon farthest, distance 252,400 miles
22	5 14 a. m.	Sun farthest south, winter commences in northern hemisphere
24	5:23 a. m.	Full moon
26	12 55 a. m.	Algol at minimum
28	9 44 p. m.	Algol at minimum
29	1:00 p. m.	Uranus nearest, distance 1,663,000,000 miles
31	12:57 p. m.	Moon passes Saturn
	6:33 p. m.	Algol at minimum

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, November 25, 1950

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GEOGRAPHY

Ice Islands as Bases

Floating masses of ice 20 miles across and 200 feet thick would be suitable for Arctic weather stations, air fields and research laboratories, conference is told.

➤ **HUGE** floating islands of ice in the Arctic Ocean are being eyed by scientists as potential bases for weather stations, air fields and research laboratories near the North Pole.

Weather experts and military research specialists at the Alaskan Science Conference in Washington listened intently as monster ice islands 20 miles across and 200 feet thick were described by Lt. Col. Joseph O. Fletcher, commanding officer of the Air Force's 375th Reconnaissance Squadron based in Alaska.

Col. Fletcher showed a photograph of a four-engined Russian plane which landed on Arctic ice 13 years ago. The inference was clear: Russia began long before the United States to study conditions along the short air route over the Polar cap.

The islands floating in the Arctic Ocean are much thicker than ordinary field ice. Scientists at the conference said they are probably chunks of glaciers millions of years old—so called fossil ice which has

never melted. There are believed to be many of them moving sluggishly through the thinner ice and open waters of the Arctic, perhaps as much as two miles a day.

No research stations now exist on these floating ice islands, Dr. A. F. Spilhaus, dean of the Institute of Technology at the University of Minnesota, said, but scientists are intrigued by their possibilities.

The polar regions are the only great gaps remaining in the world's weather network, he said. Little is known of temperature and wind conditions at sea level in the Arctic, although many airplanes have now flown over the region. Geophysicists want to know more about the atmosphere, radio conditions and the earth's magnetism at the top of the world.

The islands might be very useful for landing strips, Dr. Spilhaus said. Low level reconnaissance has shown there are level areas on the islands of ice suitable for landings.

Polar engineering is a new and startling field, he said. Solid ice may be used as a construction material like steel or wood. Alloys of ice mixed with sawdust are being studied.

From materials such as this, the meteorologist predicted, whole towns may some day be built in the Arctic on floating bases which nature has already provided in a frozen world.

Science News Letter, November 25, 1950

GEOPHYSICS

Consider Possibility of Second Magnetic Pole

➤ **THE** possibility that there may be a second magnetic north pole somewhere in the Arctic is being taken seriously by scientists

It was brought up again in a paper by two geophysicists of the U. S. Coast and Geodetic Survey, David G. Knapp and Capt. Elliott B. Roberts. The paper was presented to the Alaskan Science Conference sponsored by the National Academy of Sciences and the National Research Council.

Alaska occupies a strategic area in the attack on this "perennial riddle of Arctic magnetism," the scientists reported. From Alaska, they said, magnetic observations in the heart of the Arctic Ocean may break the mystery.

The question lies in the magnetic north pole found by James C. Ross on the Boothia Peninsula in 1831. This imaginary

point on the earth's surface has moved somewhat since it was found, but it is still not in the center of the overall magnetic field of the Arctic.

The possibility that a second magnetic pole may be pulling the field askew has been suggested before by scientists. Despite tremendous difficulties in taking magnetic observations in the Arctic Ocean, the job of tracking down the answer is being accelerated

Science News Letter, November 25, 1950

RADIO-ASTRONOMY

Better Communications From Study of Aurora

➤ **BETTER** communications in the Arctic, vital if all-out war comes, should result from studies of the aurora borealis and the upper atmosphere now being made in Alaska

Dr. A. G. McNish of the National Bureau of Standards told the first Alaskan Science Conference, sponsored by the National Academy of Sciences, that the effect of the "northern lights" on radio communications was "not altogether deleterious." Normally brilliant aurora displays mean interference with radio reception, and often blackouts. New information is giving a possibility for careful choice of frequency that will allow radio communications otherwise impossible.

Science News Letter, November 25, 1950

QUAKERS IN SCIENCE and INDUSTRY

By Arthur Raistrick, M.Sc.

An account of the Quakers, who, during the period in which they appeared to be drifting into a quiet retirement from the stress of the fight for religious freedom, were, actually, giving to their time and generation a very considerable intellectual and technical contribution, the benefits of which are still accruing to us . . . In the sphere of Technology and Finance, the Quakers prepared some of the way for the Industrial Revolution. Their powerful position and influence in the wool trade, iron manufacturing, lead mining, botany, medicine and banking is skillfully brought out.

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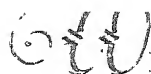
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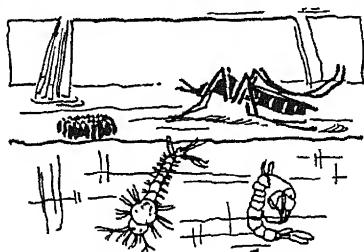
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Bloodthirsty Lady

➤ FAR AHEAD of the bears and the possums, an unpopular member of the great outdoors goes into hibernation at the first signs of frost.

The trouble is, they have not gone far enough. The ladies of the race, deadlier than the males by virtue of their inordinate thirst for warm, red blood, have simply taken a long last drink and gone off to a protected corner, a rotted tree trunk or a crevice in the rocks. The blood is converted to a reserve of fat and mother mosquito settles down to a winterlong coma.

Her two-legged enemy will not be idle during the winter, however. In the great spruce and fir forests of the Pacific Northwest, where the summertime mosquito population per cubic foot of air is sometimes brutal, scientists will be experimenting this year in an odd way. Before the winter snows begin to fall, and although there is not an active mosquito within hundreds of miles, men will be out spraying with DDT.

As the snows melt in spring and mosquito larvae wiggle into life in the dripping thaws, the water will hold a nasty surprise. The DDT dissolved in the melting snow, the scientists hope, will kill far more mosquitoes than the same amount

sprayed on the forests later in the year.

Dr. Marston Bates, writing in the magazine *NATURAL HISTORY*, tells of one mosquito variety in Africa and Malaya—there are about 2000 known kinds over the world—which has taken to bothering ants rather than humans. These bandits station themselves directly in front of hard-working ants

and glower until the ant stops and opens its jaws. Whereupon the mosquito reaches into the ant's mouth and drains off any honey it finds there.

Not that any harm should be wished upon the ants, but this is a career more mosquitoes should pursue.

Science News Letter, November 25, 1950

Books of the Week

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BILLY BUYS A DOG—Elizabeth Laing Stewart—*Reilly & Lee*, 44 p., illus., \$2.00. A clever way for a 1st or 2nd grader to learn the different types of dogs. Many full page illustrations.

THE BIOLOGY OF HUMAN STARVATION—Vol. I & II—Ancel Keys and others—*University of Minnesota Press*, Vol. I. 763 p., Vol. II 621 p., illus., \$24.00 set. The history and present problems of undernutrition throughout the world.

CINCHONA PROPAGATION—Harold F. Winters—*Gov't. Printing Office*, U. S. Dept. of Ag. Bull. No. 47, 26 p., illus., paper, 15 cents. A report on propagation methods, the history of Cinchona, and diseases affecting Cinchona, the natural source of quinine.

COPEPODS GATHERED BY THE UNITED STATES FISHERIES STEAMER "ALBATROSS" FROM 1887 TO 1909, CHIEFLY IN THE PACIFIC OCEAN. Contributions to the Biology of the Philippine Archipelago and Adjacent Regions—Charles Branch Wilson—*Gov't. Printing Office*, U. S. Nat'l. Museum Bull. 100, 300 p., illus., paper, \$1.00.

DECIDUOUS FORESTS OF EASTERN NORTH AMERICA—E. Lucy Braun—*Blakiston*, 596 p., illus., \$10.00. Primarily a reference book or a text for advanced students.

DICTIONARY OF FOREIGN TRADE—Frank Henius—*Prentice-Hall*, 2nd ed., 957 p., illus., \$10.00. Definitions of foreign trade terms, usages, practices, procedures, and abbreviations, alphabetically arranged.

DISCUSSION ON THE PRESENT STATUS OF RADIATION GENETICS—*Oak Ridge National Laboratory*, 210 p., illus., paper, free upon request to publisher, P. O. Box P, Oak Ridge, Tenn. Among the topics discussed are the effects of radiation on mitosis, fungi, *Paramecium aurelia* and chromosome structure. These papers were given at the information meeting for Biology and Medicine of the Atomic Energy Commission, March 26-27, 1948. Reprinted from the *Journal of Cellular and Comparative Physiology*.

ECONOMIC ASPECTS OF ATOMIC POWER—Sam H. Schurr and Jacob Marschak and others—*Princeton University Press*, 289 p., illus., \$6.00. An exploratory study.

EFFECTIVE TEACHING: A Manual for Engineering Instructors—Fred C. Morris—*McGraw-Hill*, 86 p., illus., paper, 60 cents.

ELECTRICITY ON FARMS IN THE EASTERN LIVESTOCK AREA OF IOWA: A Progress Report—Joe F. Davis and Paul E. Strickler—*Gov't. Printing Office*, U. S. Dept. of Ag. Circ. No. 852, 88 p., illus., paper, 25 cents.

EVERYDAY MACHINES AND HOW THEY WORK—Herman Schneider—*Whittlesey*, 192 p., illus., \$2.50. Explains how many household machines and devices work. Drawings are by Jeanne Bendick.

THE EXCEPTIONAL CHILD IN INFANCY AND EARLY CHILDHOOD. Proceedings of the Annual Spring Conference on Education and the Exceptional Child Under the Auspices of the Child Research Clinic of the Woods Schools at Langhorne, Pa., May, 1950—*The Woods Schools*, 48 p., paper, free upon request to publisher, Langhorne, Pa.

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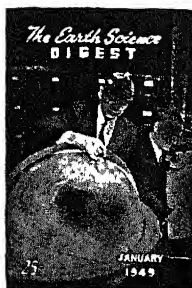
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HOLDING POWER AND SIZE OF HIGH SCHOOLS—Walter H. Gaumnitz and Ellsworth Tompkins—*Gov't. Printing Office*, Federal Security Agency Circ. No. 322, 25 p., illus., paper, 20 cents. A brief study.

IDENTIFICATION OF BRASSICAS BY SEEDLING GROWTH OR LATER VEGETATIVE STAGES—Albina F. Musil—*Gov't. Printing Office*, U. S. Dept. of Ag. Circ. 857, 26 p., illus., paper, 15 cents.

INDUSTRIAL AND SAFETY PROBLEMS OF NUCLEAR TECHNOLOGY—Morris H. Shamos and Sidney G. Roth, Eds.—*Harper*, 368 p., illus., \$4.00. For the well-informed layman. Lectures presented at the New York University forum, Jan. 10-12, 1950, on the non-military uses of atomic energy.

LIVE Vol. I, No. 1—Cameron Day and Myron Emanuel, Eds.—*National Safe Drivers Association*, 95 p., paper, \$1.00 per year. A quarterly devoted to providing information for careful driving.

MEDICAL EDUCATION IN THE UNITED STATES AND CANADA, 1949-50—*American Medical Association*, 73 p., illus., paper, 50 cents. Reprinted from the Educational Number of the *Journal of the American Medical Association*.

NEW ATOMS. Progress and Some Memories—Otto Hahn—*Elsevier*, 183 p., illus., \$1.75. A collection of the author's papers edited by Dr. W. Gaede. Dr. Hahn was winner of the 1944 Nobel Prize in Chemistry and discoverer of the fission of uranium.

THE OCCURRENCE OF BARIUM IN SOILS AND PLANTS—W. O. Robinson, R. R. Whetstone and Glen Edgington—*Gov't. Printing Office*, U. S. Dept. of Ag. Tech. Bul. No. 1013, 36 p., illus., paper, 15 cents.

PERSPECTIVES ON A TROUBLED DECADE. Science, Philosophy, and Religion, 1939-1949—Lyman Bryson, Louis Finkelstein and R. M. MacIver, Eds.—*Conference on Science, Philosophy and Religion in Their Relation to the Democratic Way of Life, Inc.* (Distributed by Harper), 901 p., \$5.50. Papers presented before the Tenth meeting of the Conference, Sept. 6-9, 1949.

PHYSICS OF THE SUN AND STARS—W. H. McCrea—*Hutchinson's University Library* (U. S. Distributor: Longmans, Green), 192 p., illus., \$2.00. A survey of the main features of the physical state of the universe.

PRINCIPLES OF GENERAL PSYCHOPATHOLOGY: An Interpretation of the Theoretical Foundations of Psychopathological Concepts—Siegfried Fischer—*Philosophical Library*, 327 p., illus., \$4.75.

PROBLEMS IN ENGINEERING DRAWING—J. N. Arnold—*Prentice-Hall*, 3rd ed., 76 p., illus., paper, \$4.35. Lettering exercises, working drawing, assembly drawing and pictorial drawing are included.

REMAINS OF LAND MAMMALS FROM THE MIOCENE OF THE CHESAPEAKE BAY REGION—C. Lewis Gazin and R. Lee Collins—*Smithsonian Institution*, Publ. 4019, 21 p., illus., paper, 25 cents.

SOURCE MATERIALS ON KOREAN POLITICS AND IDEOLOGIES—Donald G. Tewksbury, Compiler—*Institute of Pacific Relations*, Vol. II of the series of Source Books on Far Eastern Political Ideologies, 190 p., paper, \$2.50.

TURRIALBA Revista Interamericana de Ciencias Agrícolas Vol. I, No. 1—Armando Samper,

Ed.—*Inter-American Institute of Agricultural Sciences*, 63 p., illus., paper, \$2.00 per year. An inter-American quarterly presenting manuscripts on agricultural sciences and rural life. Some contributions are in Spanish and some in English.

Science News Letter, November 25, 1950

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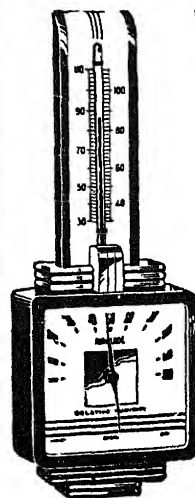
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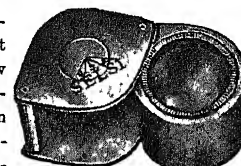


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⚙️ **BATH TUB BOAT** for the child is an inflatable three-foot affair, made of vinylite plastic, in which the infant sits at play or while being washed. It weighs a little over one pound, is easily cleaned and requires little storage space when deflated.

Science News Letter, November 25, 1950

⚙️ **FLUORESCENT "BULB"** can be screwed into the ordinary electric outlet in place of an incandescent bulb and projects only about six inches from the socket. It contains two lamp tubes within a box-like shade and gives up to 500 footcandles of light at four-foot working distance.

Science News Letter, November 25, 1950

⚙️ **ELECTRIC COOLER** for the dairy farmer holds four to eight 40-quart milk cans which need be lifted only a few inches from the ground. This front-opening electric refrigerator is designed to replace the ordinary dairy cooler in which heavy cans must be lifted and set in the cooler from the top.

Science News Letter, November 25, 1950

Do You Know?

Warfarin is a relatively new efficient poison for rats.

Steel wire nails were first made commercially in America in 1875.

Some species of acorns contain more vitamin A by weight than yellow corn.

Over half of America's proved reserves of petroleum and natural gas are in Texas.

Electrically charged wires along building ledges have been successfully used to keep pigeons away.

An exhibit recently held in Oslo, Norway, was designed to persuade Norwegians to eat more ice cream.

Only a negligible effect on the weather comes from the bursting of an atomic bomb, experiences to date indicate.

The heaviest stand of timber in all Britain is a redwood grove nearly a century old which was grown from seed from California.

The mosquito was always a nuisance but never regarded as an especially important insect until it was discovered that the blood-sucking female carries disease from person to person.



⚙️ **LAP BOARD** for the sewer, shown in the picture, has a surface marked with a grid pattern in one-inch squares to make accurate alignment of material possible. Fabrics, and pleats, can be pinned to the surface of the especially constructed board.

Science News Letter, November 25, 1950

⚙️ **STRETCHABLE FABRICS**, designed particularly for automobile upholstery but

suitable for many kinds of furniture are made of a new type of vinyl plastic which is soft and pliable and will stretch in all directions. It consists of a special elastic supporting fabric and an elastic plastic coating.

Science News Letter, November 25, 1950

⚙️ **VALVE LOCK** for cook stoves burning liquid or gas fuel is a recently-patented device which can be easily installed without material changes in either the stove or valve construction. It is designed to lock the burner valves of a stove to prevent accidental opening.

Science News Letter, November 25, 1950

⚙️ **BEDSIDE LADDER**, recently patented, is designed particularly for hospital use and can be rolled from bed to bed on its casters. It is a collapsible step-ladder, easily folded for storing, and it has handrails which assist a patient to use it with safety.

Science News Letter, November 25, 1950

⚙️ **EARPHONE** for the television receiver permits individual users to hear a program while watching the pictures without disturbing others in the room. In use, the ordinary speaker is shut off, and the earphones pick up the sound through a control box.

Science News Letter, November 25, 1950

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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



4,500 Feet Under the Sea

See Page 357

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VOL. 58 NO. 23 PAGES 353-365

PUBLIC HEALTH

Cream Repels Leeches

Cheap chemical substance, rubbed onto shoes and legs up to knees, saves soldiers in Far East from disabling wounds. Also repels mosquito.

► **LAND-LEECHES**, one of the serious plagues of Far Eastern warfare, are going to find the soldier of the future less tempting prey.

A cheap chemical substance, di-methyl phthalate, made up into a cream with white wax and arachis oil and applied to the shoes and exposed skin of persons venturing into leech country is sufficiently offensive to the leech to make it think twice before attacking its intended victim.

"A light covering of the cream to the footwear and to the skin of the leg as far as the knee sufficed to prevent attacks in country where without such aid bites could have been frequent," reports Dr. F. M. G. Stammers, (PARASITOLOGY). This British scientist compounded his repellent in London's St. Bartholomew's Hospital and then proved its usefulness in southeastern Ceylon's leech-infested jungles.

The land-leech is a particularly vicious and disabling pest of jungle warfare. It attaches itself to the skin by the hundreds, sucks large quantities of blood and leaves a wound from which blood continues to ooze for a long time after the engorged leech itself has dropped off. These wounds also frequently become the seats of severe infections.

Found in Japan, China, Burma, Malaya, the East Indies, India and Ceylon, in some areas they number as high as 50 to the square yard. Only about an inch long and

not thicker than a matchstick when hungry, the leech can worm its soft body through the eyelets of a boot and even between the mesh of a closely woven stocking, so that clothing itself is no protection against it.

Possibly even more effective than di-methyl phthalate, according to Dr. Stammers' findings, is the chemical hydroxycitronellal, but it is much more expensive than the former chemical and therefore not so practical for general use on large numbers of fighting troops. Both chemicals have the added advantage of being repellent to that other jungle pest the mosquito.

In the course of his studies on the land-leech Dr. Stammers made some interesting observations on the prey-finding tactics of the parasite. He found that contact with a warm object brought the leech into a sucking position and that it would follow a warm current of air, showing that the temperature of the body is probably one of the signals used by the leech to show it when to attack.

He also found that a 50% reduction in the light shining on the leech brought it to position for an attack, so that it seems likely a person's own shadow is another signal to the leech that a potential victim is approaching.

Skin itself, regardless of its temperature, is attractive to leeches, but Dr. Stammers was not able to extract from skin the specific chemical which attracted the leech.

Science News Letter, December 2, 1950

RESOURCES

Critical Shortage Relieved

Process known as "platforming" can eliminate danger of shortage of benzene, needed for synthetic rubber, nylon, detergents and other uses.

► **DANGER** of a shortage of benzene, the extremely critical chemical that is already in tight supply, can be eliminated "quickly, permanently and economically."

Dr. Gustav Egloff, director of research for Universal Oil Products Co. in Chicago, states that a process, known as platforming, discovered by Dr. Vladimir Haensel and already placed in commercial operation, can relieve the present shortage.

In all-out war mobilization, increased use of benzene for synthetic rubber and aviation gas would mean cuts in the production of plastics, nylon, weed killers, detergents, insecticides and many other essen-

tial military and civilian products.

For some time Universal has been studying the production of benzene through platforming. The term "platforming" represents the reforming, or changing, of gasolines in the presence of hydrogen using a platinum catalyst. This process, now being used to improve the quality of motor gasoline, will successfully produce benzene in practically unlimited quantities, he stated.

Dr. Egloff emphasized that this is a "most important finding and one that will have a significant bearing on the nation's ability to produce benzene in adequate quantities so that all military needs can be met with-

out affecting the production of civilian products requiring large amounts of this chemical."

Although approximately 170,000,000 gallons of benzene will be produced during 1950, all-out war would require at least twice this amount, a now unobtainable figure, Dr. Egloff said.

In addition to producing benzene, Universal has discovered that platforming can be used to make large quantities of toluene, basic chemical in the production of highly explosive TNT as well as an important component in fighting-grade aviation gas.

Science News Letter, December 2, 1950

RADIO

Device Turns Off Radio When Speaking Begins

► **A DEVICE** that will automatically turn off your radio when speaking interrupts music was described to members of the Acoustical Society of America meeting in Cambridge, Mass.

Its most obvious use, said Dr. R. Clark Jones of the Polaroid Corporation, who worked out the details of the device, would be by those music lovers who dislike having music programs interrupted by commercials. It might also be used by hotels or restaurants to obtain suitable background music, free from speech, directly from radios, thus supplementing wired music services.

Dr. Jones demonstrated how the small four-tube device works to the scientists. It silenced the radio after one or two syllables of speech. The radio then remained silent until about one second after the voice had stopped. Both switch-out and turning on again are entirely automatic.

In presenting the development, Dr. Jones suggested that its real importance is "the light it may shed on our knowledge of the nature of speech and music and of the working of the human brain."

The device works because of a fundamental difference between music and speech. Speech is full of extremely short pauses, such as the one between "s" and "t" in the word "stay." These pauses occur much more frequently in speech than in music, and are also much more abrupt. What the instrument does is to "listen" for these pauses, measure their abruptness, remember how many pauses there have been during the preceding few seconds and then make a "decision."

The device would not represent a threat to radio advertising, Dr. Jones declared, since it would probably cost \$15 or \$20 if commercially available and "anyone who dislikes radio commercials that much can scarcely be considered a profitable part of the radio audience."

When faced with patter songs, such as those of Gilbert and Sullivan, or with singing commercials, the device has difficulty in making a decision as to whether music or speech is playing—just as some people do.

Science News Letter, December 2, 1950

MEDICINE

Jaundice Danger Averted

By keeping plasma at room temperatures or warmer, instead of in the deep-freeze, the virus believed to be cause of jaundice would not survive.

➤ DANGER of jaundice being spread through blood plasma might be averted by changing the method of storing the plasma.

Studies suggesting this are reported by Dr. J. Garroët Allen and associates of the surgical department of the University of Chicago School of Medicine (JOURNAL, AMERICAN MEDICAL ASSOCIATION, Nov. 25).

Instead of keeping it at refrigerator or deep-freeze temperatures, it might be better to keep the plasma at room temperature or warmer.

Refrigeration, freezing and lyophilization, the methods used almost exclusively for preserving plasma, are also the best methods for preserving viruses, the Chicago scientists point out. A virus is thought to be the cause of the kind of jaundice, sometimes fatal, which has come from transfusion of pooled plasma in some cases.

The reason other disease viruses are not preserved and transmitted along with the jaundice virus, the scientists explain, is that people with other disease viruses in their

blood would be sick and could not give blood to a blood bank. The jaundice virus has a long incubation period, so that a person might have it in his blood for weeks without being sick.

The University of Chicago Clinics began storing plasma from their blood bank at room temperature in 1942 because refrigeration facilities were not available. The practice was continued because it was found satisfactory. Of 864 patients given plasma stored at high room temperature for three to 12 months, only three are known to have developed jaundice. These patients also were given whole blood and the Chicago doctors think the blood was probably the source of their jaundice.

Working with Dr. Allen on this study were Miss Carolyn Sykes, R.N., and Dr. Daniel M. Enerson, Peter V. Moulder, Richard M. Elghammer, Burton J. Grossman, Charles L. McKeen and Nicholas J. Galluzzi.

Science News Letter, December 2, 1950

PHYSICS

Zirconium Is Wanted

Metal, most familiar in mixtures for semi-precious stones, now needed in ton lots for building atomic "ovens." Has low neutron capture cross section.

➤ ZIRCONIUM, a metal that is most familiarly known in mixtures for the semi-precious gem stones, zircons, is being used in building our newest atomic "furnaces."

The Atomic Energy Commission would like to get this metal in ton lots for building atomic "ovens," but present production is only about 1,200 pounds per week. Even this is a big improvement, both in quantity and purity of the metal, over production before the metal had proved its worth as a structural material for atomic furnaces.

Only recently have methods for producing this metal in quantity been perfected. Melted zirconium, like titanium, its closest chemical relative, either reacts with or dissolves many of the usual materials used for melting vessels. Thus to separate it in pure form from the other ores with which it is found required great ingenuity for which American engineers can take credit.

The U. S. Bureau of Mines obtains the metal by reducing zirconium chloride with molten magnesium.

Highly resistant to many acids and with

a melting point above 3400 degrees Fahrenheit, the metal would seem a natural for atomic pile use, but was not taken seriously because of the difficulty of handling it, separating it in a pure form.

Materials used in atomic furnaces cannot have any special liking for the neutrons that keep the chain reaction going. Steel, for instance, sops up neutrons although it is otherwise a good structural material. Zirconium, however, has a "low neutron capture cross section," as the liking for neutrons is called by the physicists, and it, or an alloy of it, is therefore being used for building atomic furnaces.

The first sizable production of zirconium has started in a new mill at the Northwest Electro Development Laboratory of the Bureau of Mines at Albany, Ore.

Zirconium has previously been used in small quantities in flashlight bulbs, and radio tubes as well as in some alloys of steel and copper.

Although the metal is well distributed in the earth's crust, the U. S. is dependent

upon foreign supply, principally Australia, for most of its zirconium ore and concentrates. How much we are adding to our stockpile of war strategic materials is classified information.

In powder form, zirconium is black, looking much like charcoal dust. When melted, the metal is steel-gray. It can be polished to make a lustrous metallic mirror.

When AEC demands for this metal are satisfied, industry will get a crack at it, taking advantage not only of its corrosion-resistant properties, but also its alloying qualities.

Science News Letter, December 2, 1950

ENGINEERING

Lamp Promises Safer Flying and Better TV

➤ SAFER flying and better television pictures are promised with a new lamp developed in Bloomfield, N. J., by Westinghouse that is said to be the brightest lamp now available for the small current used.

Its flaming heart is an arc stream of mercury vapor that is one-eighth as bright as the sun although only one-third of an inch long. In aviation, the bright lamp is being used to shoot a narrow beam of light into the sky in order to measure cloud ceilings. The height of the cloud is recorded automatically by an instrument whose operation is based on the time required for the light to reach the cloud and return.

The value of the light for television is in projectors that televise motion pictures. This "short arc" lamp, which operates on 800 watts, produces a clear picture in black and white with excellent contrast and true gray shadings. Its expected life of 500 hours is longer than other available light sources.

Science News Letter, December 2, 1950



SHARPENS IMAGE—A new lamp one-eighth as bright as the sun helps make televised motion pictures look like live telecasts.

ASTRONOMY

Dane Heads McDonald

Appointment announced of internationally known Bengt Stromgren as director also of University of Chicago's Yerkes Observatory.

► DOCTOR Bengt Stromgren, internationally known Danish astronomer, will be director of two American observatories beginning Jan. 1, 1951.

The appointment, announced by Chancellor Robert Hutchins of the University of Chicago, marks the first time that the director of a European observatory has been named director of an American observatory.

Dr. Stromgren will be director of the University of Chicago's Yerkes Observatory at Williams Bay, Wis., and of McDonald Observatory, the University of Texas-University of Chicago cooperatively operated observatory at Fort Davis, Tex. He will also be professor of astronomy and chairman of the department of astronomy at the University of Chicago.

The 42-year-old astrophysicist is distinguished for his research and theories about what the stars are made of and what occupies the space between them. Dr. Stromgren has concluded that space and the stars are much the same except that the matter in the stars is close together.

A chunk of interstellar space the size of a big room contains about 10,000,000 atoms of hydrogen, 60 atoms of sodium, 100 atoms of calcium, four of potassium and two of titanium, according to Dr. Stromgren's calculations.

This year Dr. Stromgren received the \$5,000 Augustinus prize for his accomplishments in astronomy and astrophysics. Director of Copenhagen University Observatory and professor of astronomy there, he succeeds Dr. Otto Struve at the University

of Chicago. Dr. Struve is now at the University of California.

Dr. Elis Stromgren, Dr. Bengt Stromgren's father, was the director of the Royal Observatory in Copenhagen from 1907 to 1940 until he was succeeded by his son.

Science News Letter, December 2, 1950

MEDICINE

Seasickness Remedy Good for Ear Trouble

► PATIENTS who get dizzy and suffer nausea and vomiting because of inner ear trouble, called labyrinthitis, can be relieved by dramamine, the modern remedy for and preventive of motion sickness.

The results are so good that the drug should be given to all patients with disturbance of balance before resorting to a nerve-cutting operation, alcohol injection or other treatment, in the opinion of Dr. Leshe N. Gay, associate professor of medicine at the Johns Hopkins University School of Medicine.

Discovery of the effectiveness of dramamine in stopping or preventing air, car and seasickness was made by Dr. Gay and Dr. Paul E. Carliner just two years ago. Its effect in inner ear trouble is now reported by Dr. Gay to the Association of Military Surgeons.

The drug was given to six patients within three weeks after the dizziness, nausea and vomiting started. Regardless of the cause of these symptoms, the acute disturbance

subsided within one-half hour. In another group of 41 patients who had suffered from the same symptoms for from two months to 25 years all were either completely cured or had only infrequent and minor attacks so long as they continued to take dramamine. But 16 patients with the same symptoms did not get relief with the drug, and five got worse. The failures are unexplained.

Science News Letter, December 2, 1950

SCIENCE NEWS LETTER

VOL. 58 DECEMBER 2, 1950 No. 23

42,900 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W., Washington 6, D. C., North 2255. Edited by WATSON DAVIS

Subscription rates: 1 yr., \$5.50, 2 yrs., \$10.00, 3 yrs., \$14.50, single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925, 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

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OCEANOGRAPHY

Mountains Under Sea

Great range 1,000 miles long and up to 14,000 feet in height discovered under the Pacific. Most peaks are flat on top as if eroded by sea.

See Front Cover

► **DISCOVERY** in the central Pacific of a tremendous underwater mountain range—1,000 miles long, 100 miles wide and up to 14,000 feet in height—was announced following a joint University of California-U. S. Navy expedition which returned recently.

The submerged mountain range, which has been named the "Mid-Pacific Mountains," stretches all the way from Wake Island to Necker Island near the Hawaiian group.

Hydrographic charts had previously indicated isolated shoal points in this area, but the findings of the expedition proved conclusively that these were not isolated peaks but the summits of a long, narrow, virtually continuous mountain range as mighty as the Sierra Nevada.

Most of these sea mounts were flat on top—as if eroded by wave action in shallow water and then sunk below the surface. Clam, snail and sea urchin shells were dredged from a submerged mountain top that has now sunk to the 6,000 foot level.

The photograph on the front cover of this week's *SCIENCE NEWS LETTER* was taken 4,500 feet below the surface of the Pacific on the peak of Sylvania Seamount, near Bikini Atoll. The objects shown are probably fossil coral heads coated with manganese dioxide. At the upper right can be seen ripple marks made by underwater currents.

Entitled "Operation Midpac," the expedition was sponsored by the University of California's Institute of Geophysics and the Office of Naval Research and the Bureau of Ships of the U. S. Navy, and carried out by the University of California, Scripps Institution of Oceanography and the U. S. Navy Electronics Laboratory at San Diego.

Led by Dr. Roger Revelle, acting director of the Scripps Institution, the expedition consisted of two vessels, 85 crew members and 30 scientists from the Scripps Institution, U. C. L. A., U. S. C., Stanford, the U. S. Geological Survey and the Navy. The two ships were the *Houzon*, a 143-foot converted Navy tug which now belongs to the Scripps Institution, and the EPCE(R)-857, a 220-foot research vessel assigned to the Navy Electronics Laboratory.

The two vessels set out from San Diego for the central Pacific on July 27 and completed their 96-day, 27,000-mile trip on Nov. 1.

Chief mission of the expedition was to explore the vast, watery frontier which comprises the floor of the Pacific Ocean, and about which comparatively little is known.

Scientists had previously believed that

GEOLOGY

Largest Meteor Crater

► **NORTHERN** Canada's huge meteor crater, if meteor crater it is, was found this summer to be seven times larger than Canyon Diablo in Arizona and 17 times larger than Australia's Wolf Creek Crater.

All available evidence seems to indicate that the two-mile-wide lake is the largest meteor hole in the world. Dr. V. Ben Meen of the University of Toronto told the Geological Society of America meeting in Washington.

Dr. Meen and the crater's discoverer, a prospector named Fred W. Chubb, flew to the Ungava Peninsula on the eastern shore of Hudson Bay this summer. The geologist

the floor of the Pacific had remained relatively stable for hundreds of millions of years. But the mass of evidence brought back by "Operation Midpac" shows that in recent geologic times it was the scene of violent movement and that there have been great changes in depth.

Dr. Revelle points out that the underwater sea mounts—the gigantic "Mid-Pacific Mountains"—were thrust up and afterwards sunk. They have sunk in such recent geologic times that the submergence is thought to be due primarily to the sinking of the sea floor itself. Great quantities of ash were also brought up, indicating widespread and violent volcanic activity.

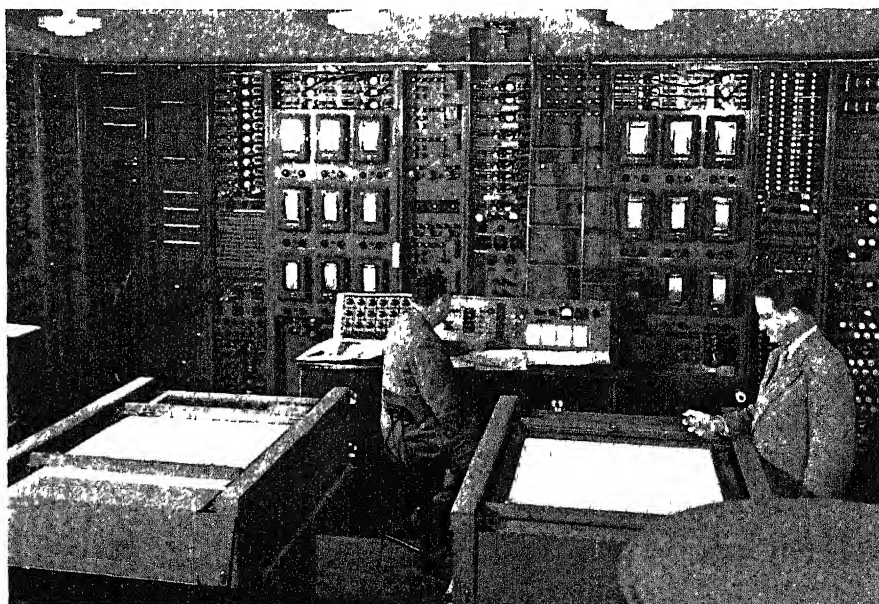
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is director of the Royal Ontario Museum of Geology and Mineralogy in Toronto.

In a barren land where no tree or shrub can grow, a granite rim was found "which seemed to represent a mass of granite bedrock which has been fractured by a tremendous explosion and lifted bodily to its present position," Dr. Meen said. Yet there is a complete absence of lava or any other evidence of a volcanic eruption.

Assuming a depth of 1,000 feet for the crater, he said, the amount of granite removed from the center by the force of the explosion is figured at more than 5,000,000,000 tons.

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TYPHOON—A new and accurate computer built to evaluate the performance of guided missiles, ships, airplanes and submarines. It was developed by engineers of RCA under contract with the Special Devices Center of the U. S. Navy.

GEOLOGY

Last Glacier Melted Only 11,000 Years Ago

➤ **RADIOCARBON**, the atomic calendar, has revealed that the last great ice cap to cover North America was much more recent than geologists have suspected.

An ice sheet which reached as far south as Buffalo, Saginaw, Milwaukee and Minneapolis began to melt only about 11,000 years ago, Dr. Richard F. Flint of Yale University reported to the Geological Society of America in Washington.

It had been previously estimated that glacier ice stood along this line no less than 25,000 years ago.

The new date was obtained by measuring the decay of carbon 14, a radioactive isotope, in a layer of peat overlooking Lake Michigan in northern Wisconsin. By use of a radiation counter, the time at which the peat was laid down could be estimated with possible error of only a few hundred years.

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MEDICINE

TB Remedy Tibione Promising for Leprosy

➤ **TIBIONE**, a chemical developed in Germany as a tuberculosis remedy, is the most promising new drug for leprosy at present, Dr. Paul T. Erickson of the U. S. Public Health Service reported at the New York Academy of Sciences conference on leprosy.

One of the so-called mold remedies, aureomycin, and para-aminosalicylic acid, called PAS for short, also have shown early good effects on leprosy sores, Dr. Erickson said. Cortisone, the anti-arthritis drug, also may be helpful in some phases of the disease, it appears from limited experience with it.

The most important single advance in treatment of leprosy occurred in 1941. That, Dr. Erickson said, was the introduction of sulfone drugs. The most recent of these is promacatin. These drugs have largely replaced chaulmoogra oil. With the mold remedies and measures for improving the patient's resistance and caring for complications, the sulfones have "materially altered the outlook for the leprosy patient and the curability of the disease."

A new method of testing the effectiveness of leprosy drugs in one-twelfth the time previously needed was reported by Drs. E. Grunberg and R. J. Schnitzer of Hoffmann-La Roche laboratories, Nutley, N. J. The method makes use of mice as testing animals.

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Although attempts began about 1850 to produce *titanium* metal from its plentiful ores, it is only in the past decade or so that commercial production methods have been developed.

RESOURCES

Soviet Uses Synthetics

Lacking petroleum supplies, Russia depends on coal and oil shale to produce additional supplies. Would need new source in case of war.

➤ **TO COMPENSATE** for their lack of petroleum supplies, Russia and her satellite countries use the expensive processes of making liquid fuels from coal and oil shale to produce additional supplies of oil, according to Dr. Gustav Egloff, Universal Oil Products Company, Chicago.

This statement was made in Los Angeles at the meeting of the American Petroleum Institute attended by oil men from all parts of the country. How much liquid fuel is being produced by Soviet countries is not known, he stated.

Current plans in eastern Germany call for the production of 20,000 barrels a day of automotive fuels from lignite, he said. In Czechoslovakia a coal-hydrogenation plant is available for producing 30,000 barrels of gasoline a day. It seems reasonable to estimate that at least 100,000 barrels a day of synthetic liquid fuels from coal and oil shale are being produced in Russia and controlled countries, he said.

The combined total of crude oil and synthetic oils produced in the Soviet area amounts to about 1,000,000 barrels a day,

he stated. This is less than 10% of the total world production.

Total world production of crude oil is about 10,500,000 barrels a day. Of this, the United States produces approximately 52%; the Middle East 17%, Venezuela 14.5%; and Russia and her satellites only 8%. The strategic oil supplies of the world are located in two principal areas, fields bordering the Gulf of Mexico and the Caribbean Sea and those of the Middle East including Iraq, Iran and Arabia.

In any long conflict Russia would have to get more oil, and the Middle East stands as the most obvious point to seize because of its proximity. Control would not only divert supplies to Russia and triple her available resources, but also would cut off this source of oil from western European countries, leaving them more prone to invasion. Russia is reported to be fomenting border incidents and tribal wars in Iran, he declared, with the evident aim of developing a weak spot which will be ripe for invasion.

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RESOURCES

U.S. Needs Synthetic Fuel

If United States is to be independent of foreign countries in the future, we must rely on synthetics to supplement domestic petroleum.

➤ **BARRING** unexpected developments in atomic or solar energy, a time will come when America will have to rely on synthetic liquid fuels and imports to supplement domestic petroleum, Dr. James Boyd, director of the U. S. Bureau of Mines, told the American Petroleum Institute.

Of these two sources only synthetics can offer an assured supply from known resources within our own borders, he said. This supply is not subject to vulnerable sea lanes, foreign expropriation or exorbitant taxes and concession fees.

"For some years new oil fields discovered in the United States have been decreasing in size and importance," he declared. "The opposite is true of discoveries made abroad. Whereas the average new field found in this country rarely exceeds 2,000,000 barrels of recoverable oil, the 300 fields discovered abroad during the two decades prior to 1943 have an estimated ultimate yield averaging about 100,000,000 barrels each.

"Our potential oil land, of course, has

been far more intensely explored. We have drilled one wildcat well for every 12 square miles of average land area here, in contrast to one drilled for every 480 square miles abroad. We now have less than one-third of the proved oil reserves of the world, and the land area of Russia alone may be a greater potential source of new oil than continental United States."

Work in the United States in making synthetic liquid fuels from coal, oil shale and natural gas, both by the government and private industry, was reviewed.

Gasoline and other synthetic fuels will soon be in production commercially by a private plant in Texas which will use natural gas as a raw material. Research and development show that high-quality liquid fuels can be obtained economically from coal and oil shale. Both of these are available in vast quantities within this nation's borders. Improved processes are lowering the cost.

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PHYSIOLOGY

Vitamin Against Cold

Experiments with rats indicate that vitamin B₁₂ added to diet enabled animals to withstand intense cold without retarding their growth and development.

➤ ONE of the new B vitamins, B₁₂ by name, may help our fighting forces withstand long periods in the cold, it appears from studies by B. H. Ershoff and H. B. McWilliams of the Emory W. Thurston Laboratories at Los Angeles.

The studies were made in cooperation with the Quartermaster Food and Container Institute for the Armed Forces.

Rats, not men, were the subjects of the experiments. When young rats were kept at room temperature and fed a purified ration, known as diet A, containing the B vitamins in synthetic form only, they grew and developed satisfactorily. But when the animals were kept continuously in a

walk-in refrigerator at a temperature just above freezing, their growth and development on this diet were markedly retarded.

Adding dried whole liver, or liver extract, or a water-insoluble liver residue to the diets of the rats in the cold room resulted in a marked increase in weight and development. A supplement of the known B vitamin was equally effective.

The effects of these diet supplements in protecting against the prolonged cold were due, at least in part, to their vitamin B₁₂ content, the scientists think.

The studies were reported in the PROCEEDINGS OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE (October).

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BALLISTICS

Pix of Deep Sea Explosions

Better torpedoes, mines and underwater bombs may result from use of special motion picture camera which takes 20,000 pictures per second.

➤ WHAT happens when explosive weapons detonate deep down in the ocean is now being studied with the use of a special motion picture camera which takes 20,000 pictures per second. Better torpedoes, sea mines and underwater bombs may result from the use of the equipment.

The methods and equipment used to obtain these photographs were developed at the Naval Ordnance Laboratory, Silver Spring, Md. They are described by Dr. Paul M. Fye of the Laboratory. (JOURNAL OF THE SOCIETY OF MOTION PICTURE AND TELEVISION ENGINEERS, October).

The cameras used are modified commercial types shock-mounted in heavy, watertight cases. A camera for depths up to two miles has a spherical casing with an inside diameter of 22 inches and a wall 1.25 inches thick. The camera lens faces a one-inch thick window, an inch and a quarter in diameter.

In the camera, the image is focused on a spinning mirror which has the focal axis of the taking lens system for its axis of rotation. One hundred framing lenses provide 100 pictures. With the mirror revolving at 18,000 revolutions per minute, 100 pictures can be taken at the rate of 30,000 frames per second. Such frame speeds are required, according to Dr. Fye, for very deep photography, where oscillations of

the explosion bubble are much more rapid than in shallow water.

The method is primarily for use in recording the oscillations of explosion bubbles. These are gas globes that are formed by the hot, expanded gaseous products of explosions. In testing the camera, explosive charges from one ounce up to 300 pounds were used. The camera is for use in gaining new knowledge of the behavior, effectiveness, and design requirements of various types of underwater explosive weapons.

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INVENTION

Conquest of Snoring Claimed in Patent

➤ WIVES of snorers take notice. The U. S. Government has just issued a patent on a device to silence the noises that come from the open-mouth sleeper.

It is called a device to prevent mouth-breathing, but reading between the lines its real purpose is revealed. Incidentally, it could be worn by a woman as well as by a man, being conformable to chest and chin.

This plastic or metal device is worn covering the throat extending from chest to chin. Held in place by a strap around the neck it prevents the lower jaw from sagging and holds the mouth closed. The chin

support is cupped so that the head can not be turned.

The device can be made to fit the "different anatomical proportions" of different users. The inventor is Cyrus H. Johnston of Richmond, Mo. Patent 2,528,370 was issued to him.

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NUTRITION

Search for Extras For Maternal Diets

➤ RATS are being milked by research scientists in the hope of finding diet extras needed by expectant and nursing mothers.

Rat mammas do better and so do their young when the mammas are given doses of one of the new vitamins, B₁₂, and are fed beef and casein, the protein in milk and cheese. This much has already been discovered from the rat milking study by Miss Marian Meyer, biochemist working under the direction of Dr. Conrad A. Elvehjem.

But while B₁₂ peps up reproduction and nursing in beef and casein-fed rats, the University of Wisconsin scientists suspect there are other still unknown diet factors needed for reproduction and lactation.

Search for these extras continues. Meanwhile, human mothers can be told that high quantities of all known B vitamins and a good source of proteins will help keep them in top condition. The diet supplying these will be advised by their own physicians.

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MILKING RATS—University of Wisconsin Biochemist Marian Meyer is milking the rat in her hand. The rats are milked in a study to find out what should be added to the diet of nursing mothers to make up deficiencies.

METEOROLOGY

**Colder in North;
Warmer in South**

➤ OLD Man Winter started out by dealing out for the period Nov 15 to Dec 15 warmer than normal weather where we do not need it and weather that is colder than normal where it certainly is not welcome.

The Extended Forecast Section of the U. S. Weather Bureau predicts that, until Dec. 15, temperatures will average above normal in most of the southern and western parts of the country, with California set to be most above normal. On the other hand, the northern Great Lakes region will be suffering under colder than normal weather for this period.

The rest of the nation—a broad band from the Pacific to the Atlantic excluding the regions mentioned above—will experience about average temperatures until Dec 15.

More snow and rain than normal is predicted for the northern border states and also in Oregon and northern California. This continues a pattern first predicted earlier. But the southern plains, the southwest and Florida can expect less precipitation than they usually receive. The rest of the nation will get about the same amount of snow and rain as usual.

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ICHOLOGY

**Tell Ancient Reptiles
By Footprints**

➤ ICHNOLOGISTS, the footprint detectives of science, are using rubber feet built from fossils to answer their usual question, "Where were you, you reptile, 250,000,000 years ago?"

The answer, of course, is "Crawling through this here mud-hole." But scientists want to know much more: what sort of creature left the fossil footprints they dig up, how broad was it between the shoulders, did it travel with a gallop or a shuffle?

To answer such questions as these, Dr. Donald Baird of the University of Cincinnati Museum told the Geological Society of America in Washington, ichnologists now can rebuild an ancient foot in rubber merely from its print preserved in rock. From the foot, oftentimes the animal can be reconstructed.

Latex moldings are taken from footprints laid down in the dim geologic age when coal was being formed. They are proving valuable clues to the animal life of prehistoric America, Dr. Baird said.

Many different kinds of primitive amphibians and reptiles crawled through swamps and mud-flats. Although their bones may have vanished, often their footprints remain, preserved in sedimentary rocks.

From a well-preserved track, scientists can deduce a great deal about the animal, his body proportions, weight and size. In some cases, Dr. Baird said, the footprints are the only clue to some bizarre reptile which long ago vanished from the earth.

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PHYSIOLOGY

**Iron in Blood
Changes During Day**

➤ THE AMOUNT of iron in your blood plasma normally undergoes a regular day and night variation, falling from a high point in the morning to a low one in the evening, scientists at the University of Utah College of Medicine have found.

The mean level of iron in blood plasma was about 66% at 5 p.m. and had risen to about 148% at 9 a.m., the scientists found in tests made on seven healthy men. Samples of a couple of teaspoons of blood were taken from these men at intervals of two to four hours throughout the 24 hours. The same sampling and testing was done on another 12 healthy men, starting at 9 a.m. The results were approximately the same, showing that the change through the day was not due to the bleeding.

The daily rhythm of blood plasma iron is apparently related to activity and sleep. Two Scandinavian scientists found that it is shifted in night workers, with the plasma iron levels highest in the afternoon or evening after waking and the lowest in the morning at the end of the night shift of work.

In a group of five normal persons who were leading irregular hours of activity and sleep, there was no definite diurnal cycle, the Utah scientists found.

So far, they do not know of any explanation for this variation in blood plasma iron level.

Details of the study, by Drs. L. D. Hamilton, C. J. Gubler, G. E. Cartwright and M. M. Wintrobe, are reported in the PROCEEDINGS OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE (October).

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PLANT PATHOLOGY

**Japanese Pest Turning
Evergreens Yellow**

➤ NEW YORK commuters whose evergreen landscaping has been hit by a sickly yellow scourge are victims of a new U. S. plant pest.

A black, lacy-winged bug from Japan has popped up mysteriously in Westchester County and southwestern Connecticut, Dr. Stanley W. Bromley of the Bartlett Tree Research Laboratories reported.

The lace bug was identified as Japanese by Dr. Norman Bailey of Boston University. But how it got here is a mystery.

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AERONAUTICS

**Pest-Control Aircraft
Will Be Needed**

➤ MORE planes will be needed next year to help farmers produce bigger crops, it was indicated by officials of the U. S. Civil Aeronautics Administration. Their great use is in pest control.

Aviators play an important part in modern farming by spreading pest-killing dusts and sprays from the air on many of the major crops and on forest trees. They also distribute seed and fertilizer to rice fields and burned-over areas following forest fires. Some 5,000 airplanes and helicopters are now used for these purposes.

More aircraft to aid farming will be needed next year because of increased acreages which will follow the action of the government in removing production controls on all crops except peanuts and tobacco. With the growing use of chemicals to kill weeds, more use of planes in weed-killing is expected. In addition to weed-killing chemicals, others are now coming into use to destroy woody plants such as scrub trees on pasture land.

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GEOLOGY

**Dry Texas Was Once
Green with Forests**

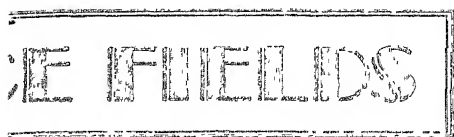
➤ A SEA once covered the now dry desert of West Texas and a mountain range once extended across the mouth of the Gulf of St. Lawrence.

This ancient geography was reported in Washington to the Geological Society of America meeting.

Dr. C. C. Albritton of Southern Methodist University told how, during the period between a drought a hundred million years ago and the present dry spell, the sagebrush country around El Paso was green with forests and even flooded by the sea. He made his discovery on long-ago climates while mapping along the Mexican border for the U. S. Geological Survey.

From studies of the rocks and fossils of Cape Breton Island, Nova Scotia, Dr. R. D. Hutchinson of the Geological Survey of Canada drew his conclusion that a mountain range once stood across the mouth of the Gulf of St. Lawrence. This long, narrow range of low mountains was separated by two seas, one of which extended in a southwestward direction along what are now the mountains of western New England.

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VETERINARY MEDICINE

Too Much Excitement Can Blind Your Dog

► YOUR dog can go blind from too much excitement, a veterinarian of Colorado A & M College has reported

A serious eye disease known as glaucoma can be caused by emotional upsets in dogs, Dr. R. H. Jourdan writes. (JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION)

The ailment builds up fluids in the eye, hardening the eyeball and sometimes causing blindness. Dr. Jourdan has found that this condition is much more common in highly excitable dogs. It may be brought on, he says, by no more than "a very exciting weekend."

Enforced rest may forestall the disease. But dogs that cannot take it easy may work themselves into such a nervous condition that glaucoma results, the veterinarian found.

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ENGINEERING

Pitting Chief Hazard To Steel Ship Hulls

► THE FORMATION of pits in steel in sea water, not general corrosion of the entire hull of a steel vessel, is an important problem to ship operators. The rate at which steel under sea water wastes away over its entire surface is low. Pitting, however, may cause serious trouble in a relatively short period.

If it were not for this pitting tendency of steel, it would be hardly necessary to paint and protect the underwater body of a ship, the Society of Naval Architects and Marine Engineers was told by Paul Ffield, of the Bethlehem Steel Company, Quincy, Mass. The average rate at which the steel is rusted away over its entire surface is less than an eighth of an inch in 20 years, he said.

Pitting is a natural tendency of steel, and the rate of attack at the pits is five to ten times greater than the general corrosion attack over the entire exposed surface, he stated. The problem of controlling corrosion of the underwater body is largely one of preventing the occurrence of pitting. Regular painting is the usual control.

Paints generally are not completely impervious to sea water under a hydrostatic head, he added, but even if water does get through serious trouble will not occur if the pitting tendency of the steel is mild. Of real concern to ship operators and builders are the more vigorous causes of pitting.

These include physical conditions which

may break down the paint and expose the steel, or an electrochemical effect so powerful that the paint film can not hold it in check.

Pitting corrosion may be due to stray electric currents generated on shore and led to the ship in the water, or to welding during outfitting which may be a source of stray currents. Pitting may also be due to galvanic currents resulting from dissimilar metals in the hull. The control of galvanic corrosion involves avoiding the use of dissimilar metals whenever possible.

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PUBLIC HEALTH

Fat People Have More Falls

► FAT PEOPLE have more falls and other accidents than persons of normal weight, Northwestern National Life Insurance Company finds. The company's Family Economics Bureau says that's one more reason for fat people to go easy on Holiday dinners.

"Fat is one of our greatest killers," the F. E. Bureau warns.

Fat kills in two ways, by promoting disease and by making various diseases more deadly. Examples, besides more frequent falls: More heart disease, more kidney trouble, more diabetes, far more cancer and three times as much high blood pressure among overweight people as among people of normal size.

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GEOLOGY

Erosion May Be Cause Of Submarine Canyons

► NEW evidence for the cause of submarine canyons—those deep-cut valleys in the ocean floor along the continental shelf—was offered by Dr. John C. Crowell, assistant professor of geology at the University of California at Los Angeles.

Speaking before the Geological Society of America meeting in Washington, he said that erosion processes operating below the surface of the sea are responsible.

Previously it had been held that the sea floor in ages past had been raised high enough to be dry land and had then been cut by rivers or glaciers. Later the land had sunk and had been covered by the sea.

Dr. Crowell has investigated several of the largest submarine canyons off the California coast. He has evidence, he thinks, to show that some of these canyons were formed in recent geological times.

"The canyons were probably eroded by the grinding action of sand and silt sliding down relatively steep submarine slopes," he said. "Some were probably eroded during the Ice Age when the sea level stood lower than today, but these too, I believe, were cut by similar submarine processes."

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BOTANY

Treated Onions Do Not Sprout During Storage

► A WAY to keep onions from sprouting during storage has been discovered by S. H. Wittwer and R. C. Sharma of Michigan State College.

The method consists in spraying the tops of the plants, while they are still growing, with a chemical called maleic hydrazide. When the plants were sprayed with a 2,500 parts-per-million solution of this chemical about two weeks before harvest, the onions did not sprout during five months in storage and there was considerably less loss from storage breakdown.

Flavor, color and odor apparently were not affected, the scientists state (SCIENCE, Nov. 17).

Similar results have been obtained with carrots and the method is now being tried on other commonly stored root crops such as sugar beets and potatoes.

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AERONAUTICS

England Building Five Different Helicopters

► FIVE different types of helicopters are being built in England, the latest being a British version of a 12-seater American craft. One purpose for which helicopters will be used is to serve cities too close together to be easily served by ordinary airplanes.

Britain, of course, is developing helicopters for the armed forces but has an unusual interest in the civil field. It pioneered the development of the helicopter as a passenger-carrying machine, and is at present operating the world's first scheduled passenger helicopter service with flights between Cardiff and Liverpool.

The country is geographically suited to a machine which can operate economically over short ranges, can fly at low speeds and land in nearby areas little larger than the machine itself.

Britain is building three large helicopters of different types and two small helicopters. In addition to the craft of American design, under construction is the Bristol 173, also a 12-seater. The Cierva Air Horse, now nearly ready for testing after an earlier failure test, is designed to carry 25 passengers and is one of the world's largest helicopters.

The Bristol 171 is a small helicopter of British design. The other British-built small helicopter is the American Sikorsky, which is called the Dragonfly in England. It has made a passenger-carrying flight across the English Channel and also has been used in city-to-city service between the centers of London and Birmingham.

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ASTRONOMY

Stars Flare Up

Geysers of flaming gases shoot out into space from five dying stars in heavens. Within a few minutes, stars may even quadruple in brightness.

By MARTHA G. MORROW

➤ GREAT GEYSERS of flaming gases are shot out into space not just by our sun, but by other stars in the heavens. So brilliant are these fiery outbursts that within a few minutes the stars double, triple or even quadruple in brightness, then in an hour or two again return to normal.

To date five stars have been discovered to flare up. One was caught in the actual act and the change in brilliance studied as it occurred. For another star, 50 such flare-ups within the past quarter century have been photographed.

No "new" stars or novae these, but tired old stars that flare up for a half hour or so as if to prove to the universe that there is some life left in the old things yet. On a bright star an eruption of this magnitude might be unnoticed, but these stars are so faint that such flaring geysers of blue-hot hydrogen gas markedly increase their total brightness.

Our nearest neighbor star, Proxima Centauri, has had 50 such flare-ups within the past 25 years, Dr. Harlow Shapley, director of Harvard College Observatory, recently reported to members of the American Association of Variable Star Observers. Until this time less than a dozen flare-ups had been recorded on any one star.

"Proxima Centauri is a little cool star, presumably on its last legs before cooling off into eternal obscurity," Dr. Shapley said. "I have just found that it has brief spurts of radiant life during which it almost doubles in brightness," he reported.

Far Out in Space

This peculiar star, although our nearest star neighbor, is far out in space. Whereas it takes light from the sun, 93,000,000 miles or so away, only eight minutes to reach the earth, light from this red dwarf requires 4.3 years to come to earth.

Credit for being the first actually to observe a flare star and carefully measure its brightness with photoelectric equipment during the act of flaring goes to Dr. and Mrs. Gerald E. Kron of Lick Observatory of the University of California.

Within 15 minutes last year quite by accident, they saw the star flare to twice its normal brightness and fade back to near-normal brightness. The star is fainter, redder and smaller than our sun, a rather ordinary star, and Dr. and Mrs. Kron calculate that only a small hot spot about the

size of the earth was involved in the outburst.

In order to cause the two-fold increase in light received from the star, they figure the amount of light emanating from the affected spot must have increased 2,000 times, its temperature rising from 6,000 degrees to 20,000 degrees Centigrade.

Other Flares Found

Less than two years ago a similar flare was found on the earth's second nearest star neighbor. At the time the star was discovered by Dr. W. J. Luyten of the University of Minnesota, who used photographs from Harvard's South African station, he noted within 20 to 30 minutes it flared up to ten times its normal brilliance, then subsided again. Seven other flare-ups have been spotted since by Harvard observers.

The first stars known to have such short periods of great brightness, stars that obviously were not double or novae, were discovered less than a decade ago by the late Dr. Adrian van Maanen of Mount Wilson Observatory. On each of two not-so-bright stars he spotted a single puzzling flare.

Bright clouds of hydrogen and calcium gases were identified in the atmosphere, surprising for stars of such low temperature. But his observations failed to indicate that the brightness was due to a small but violent outburst on the star!

The flare stars so far discovered are all reddish, very dwarf both in light and size. They are relatively cool bodies, with the atoms packed tightly together, and until these flares were discovered in a few near-by stars of this type, astronomers had supposed their light is dying out. Their radiation was believed to be decreasing slowly but steadily so that eventually they would entirely fade from sight.

But these blow-ups show there is life in the old stars. Bright hydrogen lines during the explosion appear in the spectrum of the star, but an hour or so afterwards the stars seem to be plugging along as usual with more or less normal spectra.

For decades pictures of these repeated flares on Proxima Centauri have lain unnoticed in Harvard Observatory files, awaiting discovery. About 15 years ago, Dr. Shapley recalls, he wondered if this star wasn't double, with one member eclipsing the other periodically. But no eclipses were detected when the star was studied closely and its light charted—only one discordant observation out of 70 bothered him.

Then early in October this year he again began to think of this near star and wonder if it perhaps was one of these new-found variables known as flare stars. A glance at his old measures, buried in the files, indicated that a flare-up really had occurred long before flares on stars were heard of. Examination of 592 plates in the Harvard collection showed 50 instances when the star brightened a bit, then rapidly returned to normal. From this Dr. Shapley realized that flaring is probably pandemic with such stars.

Flares on our own sun are not infrequent. The area near a sunspot sometimes suddenly increases in brightness to such an extent that within ten minutes it becomes much the brightest spot on the sun. Such flares never last more than a few hours and usually disappear almost as rapidly as they develop that part of the sun soon looks much as it did before the flare appeared.

Tied in with Blackouts

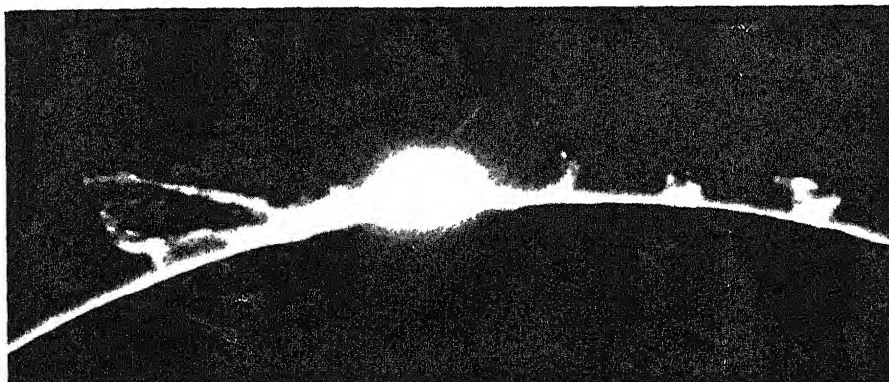
These flares are of particular interest to us here on earth as they are often tied in with blackouts of shortwave radio broadcasts. Often when a sizable flare bursts forth on the sun, immediately shortwave radios "go dead."

Shortwave broadcasts may be completely blacked out over paths in the daylight side of the globe for the duration of the flare. The blackout is believed to be caused by a sharp increase in the ionization of the lowest layers of the radio roof due to a sudden flood of ultraviolet radiation from the sun.

Astronomers, now they know flares do take place on stars other than our sun and occur quite often, are wondering about their significance. What causes these ex-



DR. HARLOW SHAPLEY



SOLAR FLARE—Shown surrounded by prominences in this photograph of the sun's limb made at the High Altitude Observatory of Harvard University and the University of Colorado at Climax, Colo.

plosions or fiery geysers, they ponder. In what manner do they affect the surrounding space? And most important of all, do they affect us here on earth and how? Many

more flare-storms must be found—and luck will have much to do with their discovery—before these questions can be solved

Science News Letter, December 2, 1950

GENERAL SCIENCE

TV Channels for Education

Top educational groups urge that certain wavelengths be set aside for educational programs. Unlimited possibilities foreseen.

➤ **SETTING** aside certain of the limited number of available television channels for educational-type programs was urged by a joint committee of seven top educational groups.

These organizations banded together as the Joint Committee on Educational Television to present their views on education in television at hearings by the FCC.

With only a limited number of channels available for TV broadcasts, it is "imperative for the national welfare that the FCC take decisive steps now to insure that there will be at least one television channel for educational use in each large city and each important educational center," Brig. Gen. Telford Taylor, the committee's counsel, stated.

"There is only room for about 300 television broadcasting stations on the channels now available for this purpose. Of these, only 107 are now in operation and there are numerous competing applicants for the remaining 'slots,'" he continued.

Gen. Taylor stated that television had virtually unlimited possibilities in medicine, in agriculture and in all phases of adult education and community extension work.

Educational groups sponsoring the Joint Committee on Educational Television include: The American Council on Education, the Association of Land Grant Colleges and Universities, the National Association of

Educational Broadcasters, the Association for Education by Radio, the National Association of State Universities, the National Council of Chief State School Officers and the National Education Association

Science News Letter, December 2, 1950

INVENTION

Ground Cotton Picker Salvages Droppings

➤ **HALF** the cotton now wasted, droppings from the plant to the ground, is expected to be salvaged with a machine recently invented which can be run through the cotton field after picking is completed to gather up this present waste.

Some 10% to 15% of the annual crop is now wasted, being dropped to the earth by the elements or in picking whether by machine or hand. Until now, no economical way has been found to salvage this waste. This new machine will gather up even partly or wholly buried cotton, it is claimed.

The machine is the invention of a Texas physician, Dr. William Rambo, assisted in part by Roy Hanna of the Oklahoma Tulsa Tribune. A patent has been applied for and is now pending. The machine is not yet in production but will be soon, it is expected.

The machine, 14 feet long, can be drawn through the cotton field by tractor, jeep or

a pair of horses. It has a rotary drum three feet in diameter which is equipped with spring steel teeth that dig into the earth.

The teeth snag the cotton fibers and drag them up to a rotary brush which cleans the cotton from the teeth and throws it back into a receiving bin. Important to the machine is a tooth-harrow which loosens up the soil ahead of the rotary drum. The overall result is that good clean cotton is salvaged. All the droppings are not gathered but tests already made show that at least half of them are.

Science News Letter, December 2, 1950

Is your Hearing worth a 1¢ Postal?

Discover a new way to HEAR AGAIN with startling clarity —by spending just 1¢ for a U.S. postcard. A way that may help you enjoy normal family and social life again... win new success and happiness. A way that's *easier* than you've dreamed possible.

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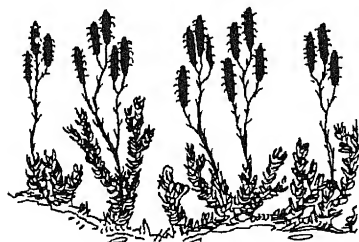
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BOTANY

NATURE RAMBLINGS



Ground Pine

➤ IT LOVES to grow in the rich, mossy places, this curious little plant with its tiny, sharp-pointed green leaves, looking for all the world like an odd fairy pine tree. It is only a few inches tall, yet it has inordinately large cone-like fruit.

But the ground pine is not really pine. It is not even closely related to the common evergreen trees. It is more in the nature of a surviving great-great-granduncle, a black sheep in the family tree which gave rise to the conifers in dim ages long ago.

Ground pine is really a member of the fern family, belonging to that peculiar

branch of the ferns known as the club-mosses. Its air of being a plant from another world is not entirely out of place, for it belongs by rights to the remote age when the world's coal was being made. Then its ancestors were proud giants, standing yards high where ground pine now stands inches, with trunks several feet around and leaves a foot long. The kinds of trees we know today did not exist then, and these were the stuff of primal forests.

But times changed, new climates came in, and the tribe of seed-bearing plants arose. The early aristocrats, these dinosaurs of the plant world, could not hold on. Only the dwarfs and the fingerlings of the ground pine family escaped, surviving by hugging the forest floor.

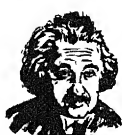
With its taller neighbors in the winter woods, however, ground pine now shares the honors of Christmas pageantry and decoration. Christmas wreaths in the shop windows are built pretty largely on a foundation of this fine green stuff with its needle-like leaves.

Like the holly it often accompanies, ground pine has suffered because of man's holiday spirit. It has long been over-used, and wide areas that once produced it in quantity have been stripped bare for the Christmas markets. Only mountain tops and reaches of country remote from the roads still have it in quantity.

For ground pine is extremely difficult to transplant and cultivate. It was a king of the forests once, now it struggles to survive. It is almost as if it looks back to its days of glory, refusing to be tampered with by man, a recent and puny force compared to the great changes in weather which made it what it is.

Science News Letter, December 2, 1950

EINSTEIN'S



Relativity explained without higher mathematics in new revised edition of A d'Abro's **EVOLUTION OF SCIENTIFIC THOUGHT FROM NEWTON TO EINSTEIN**. Acclaimed by Professors Leigh Page of Yale, Max Black of Cornell, Edward Kasner of Columbia

because it gives you the comprehensive, precise understanding of scientific theory and methods generally possessed only by advanced workers in physics

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"chopped" signals—discovering that as many as four audio indications can be followed without interfering with ordinary radio and interphone communication.

The most successful signal was a three-in-one indication for turn, bank and air-speed which gave (1) a repetitive, sweeping type of motion of the signal from left to right, (2) apparent "tilt" produced by pitch variations and (3) a "putt" sound that could be associated with the sound of the plane's engine.

"Similar early warnings and information could be given motorists in complex traffic situations through their auditory sense," pointed out Dr. Forbes. "In addition to bigger signs, very short wave radio or loud speakers at highway junctions—such as have already been used by traffic police in some cities—could be used."

Whether or not the audio-signal system for motorists would eliminate the back seat driver, Dr. Forbes would not venture a guess.

Science News Letter, December 2, 1950

AERONAUTICS

Radio Contact Important In Safe Flying of Planes

➤ ALMOST constant radio contact between pilots in flight and government ground control stations is a prime factor in safe airplane transportation, it is indicated by figures released by the U. S. Civil Aeronautics Administration.

During the first eight months of the present year, over 4,000,000 radiotelephone contacts were made by CAA ground stations with pilots in the air. This is over three times the number of such contacts for the first eight months of 1949.

Another major service given by CAA communicators to pilots flying the 60,000 miles of airways is pre-flight briefing. This includes weather information, airport conditions, radio aids, terrain and minimum safe altitudes along the route. Some 1,225,000 such briefings were given pilots during the first eight months of this year, nearly twice as many as during the same period of the past year.

Science News Letter, December 2, 1950

RADIO

Predict Short Wave To Stop Traffic Jams

➤ SHORT wave radio in automobiles may eliminate traffic jams of the future. Combine the radios with loudspeakers posted at intersections to provide audible signals, such as those that now guide airplane pilots, and traffic jams will be a thing of the past.

This is the prediction made by Dr. Theodore W. Forbes, associate professor of psychology and engineering at the University of California at Los Angeles.

Research to find ways to relieve the overtaxed eyes of airplane pilots, performed by Dr. Forbes at Harvard University, led him to this conclusion.

Beginning with the work done by Admiral Luis de Florez in 1936, in which it was shown that a pilot could fly a plane blindfolded with only two instrument indications given through his earphones, Dr. Forbes and collaborators studied the possibilities of converting the visual needle-ball airspeed system into an audio system.

They experimented with tones, pitch and

CHEMISTRY

Perfection Not Needed For Crystal Growth

➤ PERFECTION does not lead to growth, at least in crystals, the Royal Society in London was told.

Slight imperfections, in the form of at least one dislocation per growing face, are needed for a chemical crystal to increase in size in supersaturated vapor, it is shown by researches reported by Drs. W. K. Burton, N. Cabrera and F. C. Frank to the British top science body.

Science News Letter, December 2, 1950

MEDICINE

Malaria Cure

One of two common forms yields in practically 100% of cases to treatment with primaquine, derived from corn cob and coal tar products.

➤ ONE of the two common forms of malaria can now be cured in "practically 100%" of the cases by a new drug, primaquine, Dr. John H. Edgcomb of the University of Chicago announced at the joint meeting in Savannah, Ga., of the American Society of Tropical Medicine and the National Malaria Society.

Ability to prevent relapses in the vivax type of malaria is the important advantage the new drug has over other malaria remedies. When given alone, one out of five patients had a relapse. But when given with quinine, all of 33 patients recovered and had no relapses. Vivax malaria patients ordinarily may have eight to 10 attacks, or relapses, even when symptoms of the first attack have been suppressed and the patients have gotten over the attack.

Primaquine is not a "one-shot" cure. Treatment must be given under the supervision of a physician for 14 days.

Weight for weight, primaquine is four

times as effective as any anti-malaria drug yet tested in the seven million dollar research program begun for the U. S. Government during World War II to find better drugs for treating malaria.

Primaquine is derived from the common corn cob and from coal tar products. It was first synthesized by Drs. Robert C. Elderfield and James D. Head of Columbia University, New York. It was tested first on animals by Dr. L. H. Schmidt of Christ Hospital, Cincinnati.

Trials on human malaria patients were made on volunteers from the convicts at Stateville (Illinois) penitentiary, under supervision of Dr. Alf S. Alving of the University of Chicago. U. S. Army and National Institutes of Health scientists also were on the research team that tested the chemical and established the effective dose for treatment.

Science News Letter, December 2, 1950

MEDICINE

Streptomycin For TB

➤ PATIENTS with tuberculosis of the lungs do better and get well faster when given 90-day treatment with streptomycin along with other treatment such as rest in bed and operations, the U. S. Public Health Service announced.

The announcement is based on findings reported from 14 groups of scientific TB fighters in various parts of the country, working in collaboration with the Public Health Service.

Careful controls were followed so that the scientists could be sure whether the improvement was due to the drug or to some other factor. Half of a group of 541

patients got streptomycin in the same dosage. All the 541 got the usual forms of treatment.

All patients were examined by X-ray, laboratory tests, and otherwise at regular intervals for one year. The ones getting streptomycin soon began to show more improvement than those not getting the drug and continued to be ahead of the non-streptomycin patients all through the year.

Because of the careful controls during the study, there is "no question of the validity of the findings," Dr. Robert J. Anderson, chief of the Public Health Service's tuberculosis division, stated.

Details of the study are reported for the group by Drs. Esmond R. Long of Philadelphia and Dr. Shirley H. Ferebee of the Public Health Service in PUBLIC HEALTH REPORTS.

Science News Letter, December 2, 1950

PHYSICS

Predict Finding of New Particles of Matter

➤ NEW, STILL unknown particles of matter will be discovered within the next five years.

This prediction of the discovery of more of these minute, whirling bits of matter-energy of which all substances are com-

posed was made by Dr. Karl K. Darrow of Bell Telephone Laboratories.

Outlining to the members of the American Institute of Electrical Engineers the elementary particles, such as electrons, protons, neutrons and mesons, that are now known and their properties, Dr. Darrow concluded:

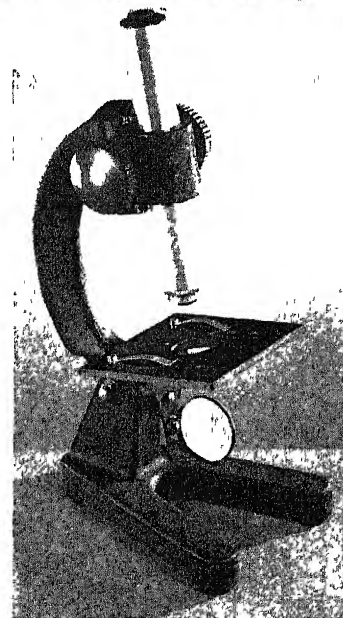
"Five years hence the list may be much longer, for accelerators of greater and greater potency are being planned or are already being built, and who knows what extra particles they can create?"

"Nor is there anyone who would dare to say that the cosmic rays do not have any more undiscovered particles up their collective sleeve," Dr. Darrow declared.

He defined an "elementary particle" as any particle of which the mass is not greater than a certain maximum value. "As this maximum value is the mass of the heaviest particle which is now regarded as elementary, you perceive that the definition is not a very rational one," he stated.

Science News Letter, December 2, 1950

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ADVANCES IN RADIOCHEMISTRY AND IN THE METHODS OF PRODUCING RADIOELEMENTS BY NEUTRON IRRADIATION—Engelbert Broda—*Cambridge University Press*, 152 p, illus., \$2.75.

APPRENTICE JOE LEARNS CONSTRUCTION SAFETY—Bureau of Labor Standards—*Gov't Printing Office*, 12 p, illus., paper, 10 cents.

THE BIOCHEMISTRY OF B VITAMINS—Roger J. Williams and others—*Reinhold*, 741 p, illus., \$10.00 A survey of the progress of research on the biochemistry of B complex vitamins

CENTER FIRE AMERICAN AND BRITISH PISTOL AND REVOLVER CARTRIDGES, Vol II Cartridge Identification—Henry P. White and Burton D. Munhall—*Combat Forces Press*, 143 p, illus., \$7.50. A reference book

CLEAN WATER IS EVERYBODY'S BUSINESS—Public Health Service—*Gov't Printing Office*, 26 p, illus., paper, 20 cents Graphic presentation of the problem, the objectives, and several suggested programs to aid in solving the problem.

THE GENERA *Chlorostilbon*, *Thalmanina*, *Hylocharis*, and *Chrysomela* Studies of Peruvian Brds. No. 58—John T. Zimmer—*American Museum of Natural History*, 31 p, 25 cents.

GENERAL CHEMISTRY. A FIRST COURSE—L. E. Young and C. W. Porter—*Prentice-Hall*, 3rd ed., 608 p, illus., \$5.65. An introductory college text.

THE H-BOMB—Stewart Alsop, Atomic Energy Commission and others—*Didier*, 175 p, \$2.50

Many aspects of the H-bomb are discussed, such as its military value, its scientific basis, the political complications, and the scientist's role Introduction by Albert Einstein Commentary by George Fielding Eliot.

HORMONE ASSAY—C. W. Emmens, Ed—*Academic Press*, 556 p, illus., \$10.00 Biological and chemical methods of assaying hormones are presented

HOW TO BUY, KEEP AND ENJOY YOUR CAR—Frank Mitchell—*Aico*, 176 p, illus., \$2.00 A handbook for automobile owners and drivers.

INTRODUCTORY NUCLEAR PHYSICS—David Halliday—*Wiley*, 558 p, illus., \$6.50 A textbook for graduate courses.

MAIZE IN THE GREAT HERBALS—John J. Finnan—*Chronica Botanica*, 64 p, illus., \$3.00 The story of the arrival of maize in Europe as reflected in the works of the Renaissance herbalists.

METHODS IN FOOD ANALYSIS APPLIED TO PLANT PRODUCTS—Maynard A. Joslyn—*Academic Press*, 525 p, illus., \$8.50 A textbook stressing principles rather than practices.

NATURAL LANDSCAPES OF THE UNITED STATES—J. Francis MacBride—*Chicago Natural History Museum*, 47 p, illus., paper, 30 cents. A brief sketch of the natural botanical layout in the United States. Beautifully illustrated with black and white photographs.

NEGATIVE IONS—H. S. W. Massey—*Cambridge University Press*, 2nd ed., 136 p, illus., \$2.50. A monograph revised to include some of the latest research material

1940 E. W. SCRIPPS CRUISE TO THE GULF OF CALIFORNIA—by Charles A. Anderson and others—*Geological Society of America—Memoir* 43, 331 p, illus., \$6.50 A report of this scientific exploration to determine the geologic processes which are or have been active in the Gulf. Maps are included

100 BEAUTIFUL PIECES OF FURNITURE YOU CAN BUILD—Craftsman Editors, *Popular Mechanics Magazine*—*Popular Mechanics*, 160 p, illus., \$3.00. Many helpful hints on how to build your own furniture.

PHILANTHROPIC GIVING—F. Emerson Andrews—*Russell Sage Foundation*, 318 p, illus., \$3.00. A monograph on the new era of giving, a brief history of giving and much general information on fund-raising campaigns.

POPULAR MECHANICS RADIO-TELEVISION AND ELECTRONICS HANDBOOK—F. L. Brittin—*Popular Mechanics Press*, 160 p, illus., \$2.50. Many helpful aids for both professionals and amateurs.

RADIO ENGINEERING HANDBOOK—Keith Henney, Ed-in-Chief—*McGraw-Hill*, 4th ed., 1197 p, illus., \$10.00. Packed full of valuable data—charts, tables, circuits, diagrams and formulas

SOURCEBOOK ON ATOMIC ENERGY—Samuel Glasstone—*Van Nostrand*, 546 p, illus., \$2.90.

Presents non-secret source material prepared at the instance of the Atomic Energy Commission Introduction is written by Gordon Dean, Chairman, Atomic Energy Commission

SPACE-TIME STRUCTURE—Erwin Schrodinger—*Cambridge University Press*, 119 p, illus., \$2.75 The geometry of the space-time theory underlying Einstein's General Theory of Relativity

STANDARD TIME THROUGHOUT THE WORLD—R. E. Gould—*Gov't Printing Office*, Nat'l. Bur. of Standards Circ 496, 30 p, illus., paper, 15 cents Contains specific information on standard time For the general reader

THE STORY OF CALIFORNIA PHARMACY—George Griffenhagen—*American Institute of the History of Pharmacy*, 58 p, illus., paper, \$1.00. A brief history.

SUPPLEMENT FOR 1949 TO CONSUMPTION OF FOOD IN THE UNITED STATES 1909-48—Bureau of Agricultural Economics—*Gov't. Printing Office*, U. S. Dept. of Ag. Misc. Publ. No. 691, 41 p, illus., paper, 25 cents

TEACHING SOCIAL STUDIES IN HIGH SCHOOLS—Edgar Bruce Wesley—*Heath*, 3rd ed., 594 p., \$4.00 This revision contains the new developments in this field since 1945

TELEVISION SERVICING—Walter H. Buchsbaum—*Prentice-Hall*, 340 p, illus., \$5.35. Written for service technicians

AN ULTRAVIOLET MULTIPLE TABLE The Spectra of Hydrogen, Helium, Lithium, Beryllium, Boron, Carbon, Nitrogen, Oxygen, Fluorine, Neon, Sodium, Magnesium, Aluminum, Silicon, Phosphorus, Sulfur, Chlorine, Argon, Potassium, Calcium, Scandium, Titanium, and Vanadium—Charlotte E. Moore—*Gov't Printing Office*, Nat'l. Bureau of Standards Circ 488, Sect. 1, 78 p, paper, 45 cents.

A WORLD AIRLIFT The United Nations Air Police Patrol—Elvira K. Fradkin—*Funk & Wagnalls*, 216 p, illus., \$2.85 The author presents his idea for prevention of World War III

Science News Letter, December 2, 1950

WILDLIFE

Buffalo Herd Growing; Largest in Recent Years

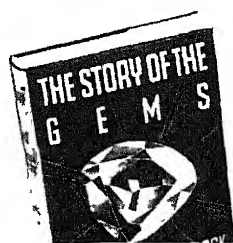
➤ THE largest herd of buffalo in North America, descendants of shaggy monsters which once roamed the continent by the millions, now totals between 12,000 and 15,000 animals.

This count was made in Wood Buffalo Park in the Canadian Northwest Territory and Alberta Province. It is reported by W. A. Fuller of the Canadian Wildlife Service. (JOURNAL OF WILDLIFE MANAGEMENT, Oct.).

The bison herd at the turn of the century stood at only 300 members. In 1893 the Canadian government made it illegal for any one to molest the bison. A warden service was established in 1911, and the buffalo park was created in 1922.

The recent count of the buffalos, made by plane, is believed to be the most accurate census yet taken of the growing herd.

Science News Letter, December 2, 1950



STORY OF THE GEMS

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Curator of Minerals and Gems,
American Museum of Natural History

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❁ **TELEVISION POINTER**, which appears in white or black superimposed over the picture on the screen of the viewer, is operated by the commentator. It makes football plays easy to follow, or identifies a speaker in a group

Science News Letter, December 2, 1950

❁ **WEATHERPROOF SPRAY** for roofs and sidewalls is a Vinylite resin resistant to moisture, abrasion, most acid fumes and fire. It can be used to repair old roofs built up with pebbles, to seal cracks in new roofs before final coating, or sprayed on a felt or pitch roof.

Science News Letter, December 2, 1950

❁ **MICROFILM VIEWER** magnifies about 10 times, is designed for the convenient reading of short lengths of film, a form in which many public documents are now recorded. This inexpensive small-size viewer does not cause appreciable eye strain

Science News Letter, December 2, 1950

❁ **FLOOR CLEANER**, to remove old varnish, shellac or wax in preparation for a new finish, is an organic liquid solvent which eliminates the need of a sanding machine. It is spread on a portion of the floor, rubbed in with steel wool, then wiped with a cloth.

Science News Letter, December 2, 1950

Do You Know?

American capacity to mine coal is 30% to 40% above demand.

Brazil, the largest of the Western Hemisphere countries, includes half the area of South America

An experimental factory ship is now used by a New England fishing concern; fish are sliced on shipboard as soon as caught and the fillets immediately frozen.

The powerful downdraft of a hovering helicopter was used to drive an escaped inflated raft, on which were two children, from choppy waters to the shore.

Ammonia is an important industrial chemical; it is a basis for many nitrogenous fertilizers and a raw material for dyes, pharmaceuticals, plastics and many other products.

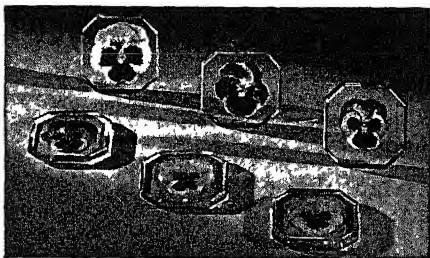
Many Americans took Geiger counters with them on their vacations in the country this year, it is said; the object was prospecting for uranium as a side-line vacation activity.



❁ **OVERALLS** for the youngster, shown in the picture, are easy to put on and take off because they open all the way down the outside of each leg. Vinylite plastic lining used in them takes the form of a built-in panty that is both moisture and stain resistant

Science News Letter, December 2, 1950

❁ **BARBERING APRON**, for use to keep hair clippings from the clothes of the customer, is rectangular in shape but has a V-shaped opening extending downward at



REAL PANSY COASTERS

These attractive coasters were made by embedding real pansies in Castolite, a new liquid casting plastic. With it students embed real flowers, butterflies, shells, photos, medals, etc. to make unusual jewelry, buttons, coasters, plaques, tiles, book ends, trays, other distinctive objects. Successfully used by hundreds of schools and colleges. Write for new FREE folder "Liquid Magic" showing things students can make. Many ideas for Christmas. The Castolite Company, Dept. P-50, Woodstock, Ill.

its upper end. The hems of the opening in this newly patented apron contain elastic cord to fit tight around the neck

Science News Letter, December 2, 1950

❁ **INSULATED NAIL**, for use in electrical wiring to hold two wires in place on a wall and hold them apart, is made of metal but has a hard plastic material covering head and part of the shank. This insulating plastic is capable of withstanding hammer blows

Science News Letter, December 2, 1950

❁ **SEALING STRIP**, to prevent water seepage around the wall edges of bathtubs and sinks, comes in a kit with a cleaning fluid, water-proof adhesive and a brush. The strip itself has a high-gloss white finish and is easily cleaned with a wet cloth

Science News Letter, December 2, 1950

Coal tar is one of the most valuable raw materials of modern chemistry.

A coast-to-coast survey shows that black is the most popular color for automobiles

The sickle-billed hummingbird of South America has a curved beak that enables it to feed on flowers whose calyxes are upright

Korea is an important mining country, producing iron, tungsten, molybdenum, graphite, manganese, aluminum, cobalt, nickel, copper, lead, zinc and other ores.

A new steel 217-foot tower on the top of the high Empire Building in New York City to be used in television broadcasting, will enable receivers 50 miles away to pick up clear pictures.

NEW Model SL MINERALIGHT

the Ultra Violet Black Light

For Schools... Hobbyists
... Laboratories

This new, light-weight MINERALIGHT has adequate intensity for general use. It is particularly valuable for laboratory work. Schools have found it furnishes new interest in science teaching, geology, physics and chemistry. Hobbyists find new beauties in nature and enjoy collecting fluorescent minerals. MINERALIGHT Model SL is available in either long or short wave. Field units including batteries, carrying case with daylight viewing aperture available... Write for complete information.

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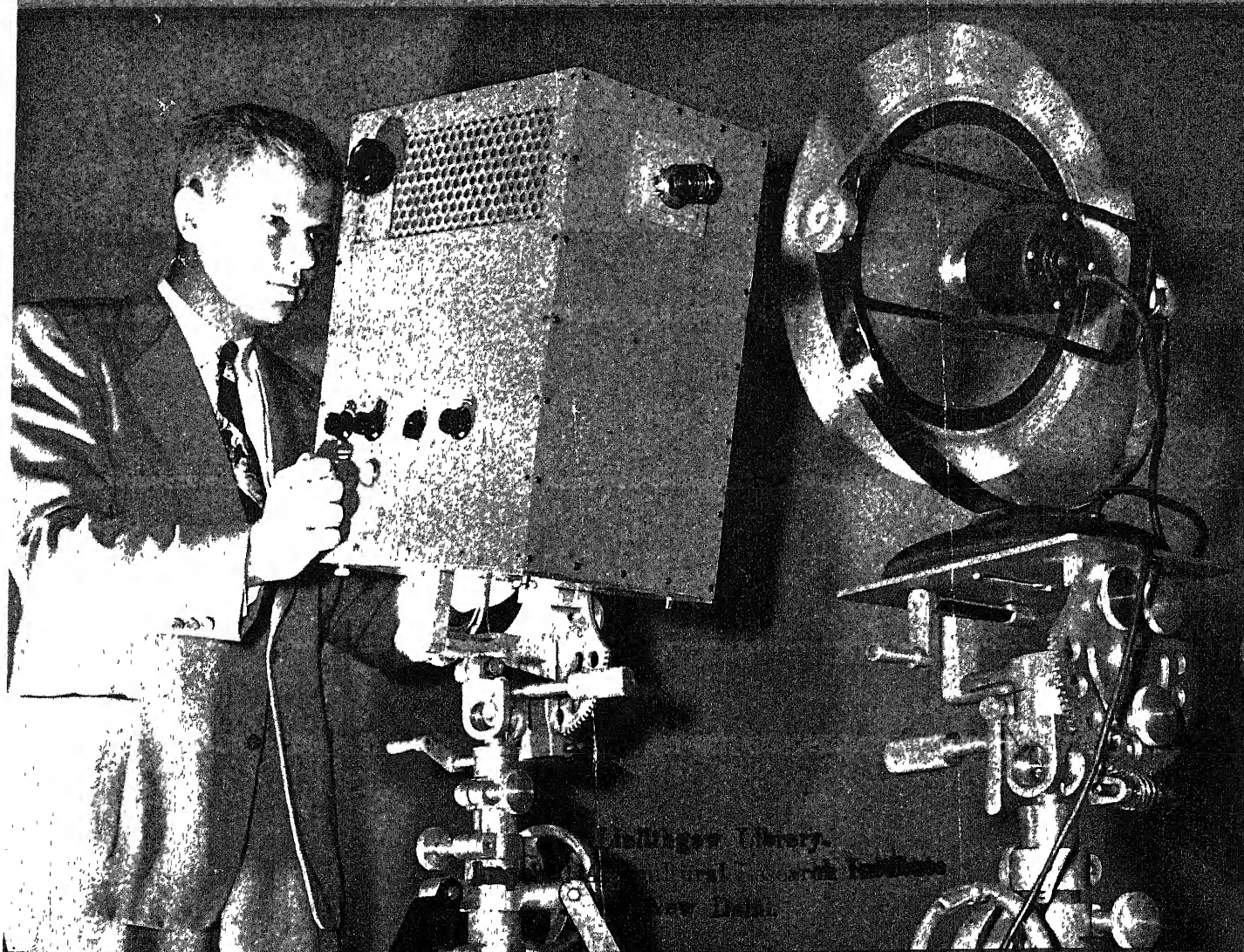
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December 9, 1950

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Freezes Motion

See Page 374

A SCIENCE SERVICE PUBLICATION

\$5.50 A YEAR

VOL. 58 NO. 24 PAGES 369-384

Testing for sound lost between telephone receiver and ear. Many subjects were used in these tests.

How to compensate for a curl . . . and add to your telephone value



Bell scientists know that the telephone is not used under ideal laboratory conditions. There is never a perfect seal between receiver and user's ear. A curl may get in the way, or the hand relax a trifle. And ears come in many shapes and sizes. So some sound escapes

Now, sound costs money. To deliver more of it to your ear means bigger wires, more amplifiers. So Bell Laboratories engineers, intent on a thrifty telephone plant, must know how much sound reaches the ear, how much leaks away. They mounted a narrow "sampling tube" on an ordinary handset.

The tube extended through the receiver cap into the ear canal. As sounds of many frequencies were sent through the receiver, the tube picked up a portion, and sent it through a condenser microphone to an amplifier. That sampling showed what the ear received.

As a result, Bell scientists can compensate in advance for sound losses—build receivers that give *enough* sound, yet with no waste. That makes telephone listening always easy and pleasant.

It's another example of the way Bell Telephone Laboratories work to keep your telephone service one of today's biggest bargains.



Automatic recorder plots sound pressures developed in the ear canal at different frequencies.

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MILITARY SCIENCE

Use of Atom Bomb

Decision whether to use this weapon must be based on information about concentration of Communist troops and nature of terrain as well as source of materiel.

► CONGRESSMEN, U. N. delegates, Defense Department officials are seriously discussing whether to use any of our stock of A-bombs against the Chinese Communists.

It is rumored that this country has a stock of from 350 to 400 A-bombs. If that is so, A-bomb production is probably between 10 and 20 per month. Recently, it has been announced that this production will be stepped up.

A-bombs can be used tactically or strategically—provided the target is worth the price of the A-bomb.

Tactically, it can be used against concentrations of troops in the field.

Military commanders will have to consider two factors:

1. How many troops there are per square mile
2. What the terrain is like.

Only twice has the A-bomb been used in battle. In both cases it was used in crowded cities. At Hiroshima, the population was 35,000 per square mile. In the 4.7 square miles destroyed by the A-bomb, 15,000 per square mile were killed and 15,000 per square mile injured. At Nagasaki, the A-bomb destroyed only 1.8 square miles, but there, with a population density of 65,000 per square mile, 20,000 per square mile were killed and 22,000 per square mile injured.

The difference in the extent of the damage was because Hiroshima was built on flat ground while Nagasaki was hilly.

There are between 200,000 and 300,000 Chinese Communist and North Korean troops in northern Korea between the Manchurian border and the United Nations front lines. This is mountainous territory. Mountains and hills greatly diminish the effects of the A-bomb.

However, it is believed that 700,000 or more Chinese Communist troops are being held in reserve on the other side of the Manchurian border. These troops are, perhaps, much closer together—hence there are probably many more of them per square mile. Yet, once again, the terrain factor must be considered.

In Hiroshima and Nagasaki, it was not possible to determine precisely which of the three lethal effects of the A-bomb was responsible for killing those who died within 2,500 feet of ground zero. Any of the three effects would have been fatal. But, generally, 20% to 30% died from burns, 5% to 15% from radiation and the rest from blast.

This picture would change in the field, away from the buildings of a city. Some of the deaths from burns happened when buildings caught fire after falling around

open fires. Many of the blast deaths were also indirect, from collapsing buildings, flying glass, etc.

Armies in the field are seldom housed in concrete buildings.

Unless the ground were extremely hilly, this, however, would mean less protection from gamma rays and from thermal radiation.

Therefore, if United Nations tactical planners can find a considerable number of troops concentrated within a few square miles of relatively flat land—the A-bomb would be the weapon. If, however, the troops are spread out and the terrain is hilly, more conventional weapons scattered over a wider area would be more effective.

In strategic planning, the generals are not out primarily to kill people. They wish to destroy the ability of a city to contribute to the enemy's war effort. This means they want to destroy factories, rail and wire communications centers, and governmental and military headquarters.

This was done to two cities in 1945. As has been previously noted, fire and air blast destroyed 47 square miles of the relatively flat Hiroshima and did decreasing damage

from there on out to edge of damage.

It should be pointed out that most factories in Hiroshima escaped damage because they were built on the edges of the city. However, the killing and wounding of 140,000 persons meant that the factories could not open for want of workers.

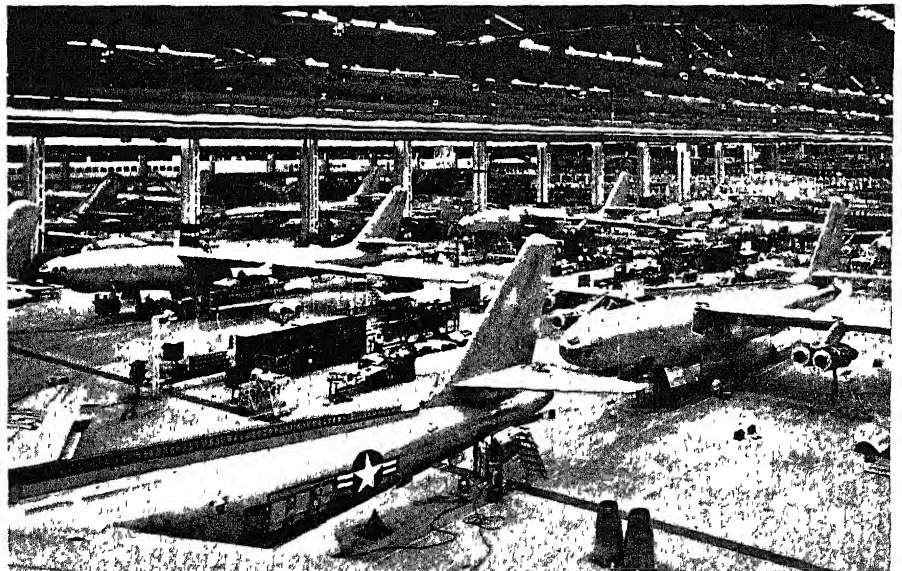
Here again, planners rule out targets too small for efficient use of the A-bomb's great power. Cities under 50,000 usually cover too small an area. In the Far East, cities under 100,000 probably would not be developed enough industrially to be worth an A-bomb.

If the purpose of dropping a bomb is to cut rail or road communications—the A-bomb would be a singularly inappropriate weapon. Well placed conventional bombs, along the thin and narrow lines can do much more damage.

There are between 60 and 80 cities in China and Manchuria with more than 100,000 population. Planners will have to consider how much materiel is going to the Communist armies from these cities and how much is coming from Siberia. They will have to consider that the Chinese Communists lived for years—and grew in numbers, territory and power—without controlling any of China's major cities or any of her railroads.

Those factors, plus the number of A-bombs we have in stockpile and the possible future use for them, the expense in men and money of conventional bombing, will have to be considered carefully before any decision is to be made on strategic use of the A-bomb in the Far East.

Science News Letter, December 9, 1950



STEPPED UP PRODUCTION—Expanding activities in airplane plants, due to the world's unsettled conditions, are reflected in this Boeing plant at Wichita, Kans., where giant jet-propelled bombers for the Air Force are being made. Picture shows the B-47, 185,000-pound plane in the 600-miles-per-hour class. It is the Stratojet, an improved version of the plane that crossed the continent from Seattle to Washington, D. C., in three hours and 46 minutes.

AERONAUTICS

Planes of that speed predicted for year 1960. Must have pencil-thin fuselage, sharp nose and thin wings. Engines must have more thrust.

➤ AIRPLANES able to fly at 1700-mile-an-hour rate may be feasible by 1960, it was predicted by Harold Lusk, Douglas Aircraft Company, at the meeting of the American Society of Mechanical Engineers in New York. His discussion was devoted primarily to power plants and design for that high speed.

He presented a paper prepared jointly by him and Harold Klein of the same company. Since the power required for flight depends upon the amount of drag to be overcome, the aerodynamicist's first task is to reduce drag to a minimum, he said.

This is accomplished by creating airplane "profile," or shape, which offers the least resistance to motion under the special conditions of supersonic speed. That is why supersonic planes must have pencil-thin fuselages, sharp noses and thin wings.

Even so, he continued, engines required to ram airplanes through the air at two and one-half times the speed of sound must produce three or four times as much thrust for their weight as engines acceptable for subsonic conventional aircraft. This goal is obtainable in the near future, he predicted, through improvements in jet engines and adding after burners.

Proper engine installation also is essential in order to realize supersonic flight, he stated. "Thrust actually developed by a turbojet engine depends not only on the engine design but also on the installation in the airframe."

Loss of efficiency resulting from improper air inlets is much more critical at super-

sonic speeds than at lower speed levels. An improper air inlet not only increases drag but results in a loss of jet thrust at high speeds. Adjustable inlet scoops which permit the jet engine to gulp only the amount of air needed at any given speed are needed. Engine cooling is another major problem at supersonic speeds

Science News Letter, December 9, 1950

MEDICINE

Chemical Urethane Best for Bone Cancer

➤ THE CHEMICAL urethane is the "treatment of choice" for the bone marrow cancer, multiple myeloma, in the opinion of Drs. Richard A. Haines, William N. Powell and Herbert Bailey, of Temple, Tex.

At the meeting in St. Louis of the Southern Medical Association, they reported good results with this chemical in five patients.

One, treated for seven months, has had relief of bone pain and there is evidence that the neck vertebra, broken through the disease, is recalcifying. A second patient, treated with urethane, for over a year has had marked improvement of her anemia as well as relief from the "exquisite" bone pain. She has also returned to some of her household duties.

Besides the improvement in the patients' well being, the Texas physicians reported definite changes in the architecture of the myeloma cell during urethane treatment.

ACTH, famous anti-arthritis pituitary

gland hormone, helped one out of three myeloma patients treated.

Stressing the importance of early diagnosis of this cancerous disease, the Texas physicians said that complaint of bone pain was the most frequent early complaint, with anemia and albumin in the urine as the two most common findings from laboratory tests.

Science News Letter, December 9, 1950

SCIENCE NEWS LETTER

VOL. 58 DECEMBER 9, 1950 No. 24

43,200 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W., Washington 6, D. C., NORH 2255. Edited by WATSON DAVIS.

Subscription rates. 1 yr., \$5.50, 2 yrs., \$10.00; 3 yrs., \$14.50, single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address. Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PENNSYLVANIA 6-5566 and 360 N. Michigan Ave., Chicago. STATE 2-4822.

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RADIO

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GENERAL SCIENCE

Fear Loss of Personnel

Armed Forces laboratories must compete with industry which can pay more for professional men and technical workers. Also faced with threat of losing reservists.

➤ AS DEFENSE production orders mount up and recent enlarged appropriations for Defense Department research begin to come through, armed forces laboratories are starting to feel the effects of competition from industry for scientific and technical manpower. Private industry can pay more.

A recent example of this, with others like it expected, was the case of an underwater sound physicist at the Naval Research Laboratory. He receives a salary of \$7,800 a year. A private concern offered him \$12,000. Fortunately, this particular physicist will probably stay with the government because he likes his work.

The pinch is not confined to Ph.D.'s. The Naval Research Laboratory has approximately 3,000 employees, of whom 1,000 are scientists and another 1,000 technicians and craftsmen. The latter build the machines and equipment which are the tools and products of scientific research.

Private industry is beginning to compete

for these skilled workers, too. This competition is not confined to defense industry—television manufacturers have made tempting offers to some of the workers at this Laboratory.

Officials at the Laboratory do not know what the answer will be if all-out mobilization hits the nation. The answer will come from a higher level of government. Right now the National Security Resources Board is considering plans which envisage control during all-out mobilization of scientific and technical personnel, but whether or not this will include skilled laboratory workers is another question.

Another worry in this, and other, defense department research operations is the large number of employees in the reserves. Of the 3,000 employees at the Naval Research Laboratory, between 500 and 600 are in one component or another of the reserves.

If a man who is called up wants to go on active duty, the policy is not to ask for

deferment. However, deferment has been asked for most employees in the reserve who have been called up. In all cases, except for those who are in Naval Aviation reserve units, this deferment has been granted.

What worries those responsible for keeping up the quality of the research work in the Naval Research Laboratory is, in view of the large percentage of reservists on the staff, what will happen during a total mobilization?

Right now, the Naval Laboratory is searching for 46 high level scientists—physics Ph.D.'s, electronics scientists and others—either to fill jobs which have been vacant for some time or to take on new jobs. It needs men to do research in sound propagation, optics, airborne and shipboard electric systems, antennas, vacuum tubes, radar, psychology, nuclear physics and other subjects.

Science News Letter, December 9, 1950

MEDICINE

ACTH Life-Saving In Severe Burn Case

➤ ACTH, one of the two wonder drugs for arthritis, was credited with saving the life of a man who was critically burned over 71% of his body.

Doctors gathered in Cleveland for the American Medical Association's meeting were given an opportunity to see the patient, T. C. Gains of Parker, Ariz., as well as hear the report of the case by the physician who treated him, Dr. M. James Whitelaw of Phoenix.

The case is considered of special significance because Mr. Gains's burns were from a gasoline explosion, and therefore comparable to those which cause many casualties in modern warfare.

In the course of recovering from the burns, Mr. Gains had an attack of a kind of pneumonia and also an appendicitis operation.

In addition to saving Mr. Gains' life, ACTH was credited with the fact that, contrary to medical experience, 39 of 40 tiny skin grafts from other persons not only took root but grew outwards into covering for the exposed muscles, without sloughing off later as is usually the case.

Unusual also was the fact that Mr. Gains did not have any crippling from contracting scar tissue which is common in deep and extensive burns.

After ACTH treatment was begun, 24 hours after the accident, Mr. Gains was practically free of pain and needed very little narcotic drugs. There was none of the acute toxicity, severe shock and complete prostration usual in such cases, and he showed a sense of well-being and had a good appetite. ACTH was given for 92 days, but Mr. Gains was up and about on the 27th day.



LIFE SAVED—Although burned over 71% of his body, T. C. Gains of Parker, Ariz., was saved by treatment with ACTH. In addition to his troubles with the terrible burn, Mr. Gains had to have an appendicitis operation (note scar) and had a bout with pneumonia. This photo was taken 102 days after treatment was started.

ASTRONOMY

Cause of Twilight Glow

That soft illumination of the sky in early morning and evening dusk is due to dust particles blown off of comets vaporized by sunlight.

► THE TWILIGHT glow of early morning and evening is due to comet dust, Dr. Fred L. Whipple, Harvard astronomer, has reported to the Harvard Observatory's visiting committee.

The soft illumination of the planet path in the sky that the sun has just left is of interest to astronomers as well as poets and lovers. Known as the zodiacal light, it is caused, Dr. Whipple has concluded from theoretical studies, by a cloud of very small dust particles circling the sun in the plane of the earth's orbit. This dust cloud scatters the sunlight so that there is light even when the sun is no longer visible.

These particles of dust also scatter the light about the sun at the time of total solar eclipse and add to the beautiful pearly luminosity of the solar corona which is a striking spectacle of the sun's complete eclipse.

Actually these particles that cause this heavenly glow are small fragments from comets. They are composed of material blown off comets when their icy surfaces are vaporized by sunlight.

The dust particles shot away from the comets in this way slowly spiral into the sun under the influence of light pressure and the momentum of light.

One ton of such fine comet dust added to the cloud around the sun each second would be sufficient to keep the zodiacal light glowing indefinitely, Dr. Whipple's calculations show. Actually comets contribute some 30 tons per second.

The planet Jupiter, through its gravitational effect, keeps all but a small fraction of the cometary material from spiraling into the sun. Very few of the larger particles which range from pinhead to marble size contribute to the zodiacal light. Such debris of the solar system, that produce shooting stars or meteors when they plunge into the earth's atmosphere, have their orbits disturbed by Jupiter or this giant planet swallows up the sizable cometary particles before they have time to spiral into the sun.

The small bits of dust size can spiral more rapidly, Dr. Whipple finds, and thus evade the gravitational barrier set up by Jupiter.

Science News Letter, December 9, 1950

PHYSICS

Simple Cloud Chamber

You can see cosmic ray tracks with home made device made from two metal disks and glass cylinder with container of dry ice and tray of water.

► NOW PEOPLE at home can actually see the tracks of the cosmic rays which are constantly bombarding every man, woman and child from outside our atmosphere. Atomic scientists at Brookhaven Laboratory, Upton, N. Y., have developed a cloud chamber which is not only simple enough to be built in the home but is also an improved research tool for the laboratory.

The new chamber was described by four Brookhaven scientists attending meetings of the American Physical Society in Chicago.

Cosmic rays are made up of atomic particles much too small actually to be seen. But as they dart through a saturated atmosphere in a cloud chamber they leave a trail of small droplets which are clearly visible, like the vapor trail left by high flying aircraft.

Earlier cloud chambers permitted seeing these tracks only for very brief periods of

time. The new, simpler chamber manufactures a continuous vapor which means that scientists can view the tracks continuously. Thus they will be able to observe, without interruption, many interactions of atomic particles.

The essential ingredients are easy to get and easy to put together, the scientists said. Dry ice is placed in a flat container underneath a metal disk 5 to 17 inches in diameter. On the top surface of this disk is placed black velvet, to provide a background for viewing the tracks. A glass cylinder, slightly smaller in diameter than the disk and open at both ends, is placed on this disk. Felt soaked in methyl alcohol is fastened to the lower side of another metal disk which is then placed on the top of the glass. A tray of water at room temperature is placed on top of the upper disk. When a strong light—a powerful flashlight—is beamed on the velvet, the cham-

ber becomes a showcase for many atomic events.

The new chamber was worked out by Drs. E. C. Fowler, D. H. Miller, R. P. Shutt and A. M. Thorndike of Brookhaven. It is an improvement of ideas already put forth in other laboratories.

Science News Letter, December 9, 1950

AERONAUTICS

Urge Same Standards For All Airplanes

► IDENTICAL requirements for the approval of airplanes as airworthy on the part of the military and the Civil Aeronautics Administration are essential, particularly in times of emergency, the American Society of Mechanical Engineers was told.

The commercial cargo fleet could become immediately available for emergency military operations if the approval requirements were the same, Alan F. Kelsey, Boeing Aircraft Company, Seattle, told the engineers. The differences are not fundamental, he indicated, and if eliminated, planes could be transferred from one service to another merely by changing the insignia.

The lack of standardization in requirements increases the cost of aircraft for both the commercial operators and the government, he declared, pointing out some of the differences. The Air Force requires a fire extinguisher system in the engine nacelle, the CAA does not. The increased quantity of carbon dioxide for the purpose in the military craft requires a completely different system than in the commercial plane.

Another item preventing certification of military transport aircraft is the CAA requirement for a fuel dumping system, he continued. "If it is necessary for commercial transport aircraft, why not for military? Both carry passengers who are entitled to equivalent standards of safety. The aircraft manufacturer could produce better aircraft for less money if differences in opinion such as these were resolved."

Science News Letter, December 9, 1950

On This Week's Cover

► THE FILAMENTS of a radio tube vibrating at extremely high frequency and other motion recurring as often as 300,000 times per second can be "frozen" either visually or photographically by a new type of stroboscope shown on the cover of this week's SCIENCE NEWS LETTER.

The new device, developed by the Naval Ordnance Laboratory at White Oak, Md., depends on the use of an electron tube similar to the snooperscope tube which, during the war, enabled sharpshooters to spot their targets at night.

Unlike the conventional high speed photography, the new NOL stroboscope can be used in normal lighting.

Science News Letter, December 9, 1950



LIGHT BUT STRONG—This airborne bulldozer is light enough to be flown to advanced combat positions, but is capable of doing the heavy work of its weighty predecessors.

ENGINEERING

Airborne Tractors

► **SPECIAL** road-building and other earth-moving machines, suitable for transportation by airplane, are being developed and tested by the U. S. Army Corps of Engineers. A combination of strength and light-weight is the aim.

Object of the program is earth-moving machines light enough to be rushed by air to advanced combat positions but rugged enough to do the work of the heavier machines usually employed for such purposes. A top weight of 16,000 pounds is the desirable limit. Included are such machines as tractors, dozers, cranes, scrapers, power shovels and rooters.

Some of the machines being developed are lighter models of present standard ma-

chines which are equipped with the power unit of the heavier types. These make up in speed and by other means the lost advantage of sheer weight. Some of the equipment has built-on containers to hold sand or other ballast to provide increased weight for traction when in actual use.

Among the items undergoing tests is a specially designed airborne crawler tractor of a type not commercially available. It has a hydraulically operated dozer blade, and is powered with an 85-horsepower diesel engine. The use of hydraulic controls makes available the mass of the machine for the bite into the earth, rather than only the weight of the pan and blade as in the customary cable-operated blade.

Science News Letter, December 9, 1950

SOCIOLOGY

Family Stability Myth

► **THE IDEA** that families were more stable in "the good old days" is largely a myth, declares Dr. Ray H. Abrams of the University of Pennsylvania sociology department.

There were "free love" colonies in the 1800's, he points out. Movements for equal rights for women and widespread prostitution a century ago were other signs of family instability in "the good old days," in Dr. Abrams' opinion.

Dr. Abrams does not think much of the status of family stability today, either. In a special "family stability" issue of the *ANNALS OF THE AMERICAN ASSOCIATION OF POLITICAL AND SOCIAL SCIENCE*, (November), he says:

"If we were to add to the divorce rate the desertions, the separations, and those who would like to sever the marriage bonds but for one reason or another do not, the sum total of marital disorganization would

be at least two to three times that represented by the divorce statistics."

Declaring that society seems more interested in preserving the status quo of its social institutions than in determining whether these human institutions actually promote human welfare, Dr. Abrams advocates that we get away from our fear of change.

"Ever before us is the blind worship of social institutions and the failure to realize that these institutions do not necessarily give us genuine stability," he says.

As to what makes a family stable, Dr. Abrams declares that "within the stable family there are enough inner resources to enable it to pull itself together in time of crisis or dis-equilibrium, enough resilience to enable it to come back to relative normality, and interrelationship between the members of the family which is strong enough and meaningful enough to continue functioning in terms of the emotional needs of the individuals concerned."

Science News Letter, December 9, 1950

PHARMACY

World Standard Set For Arthritis Remedy

► **ARTHRITIS** patients and their doctors all over the world will be helped by action taken by the World Health Organization's expert committee on biological standardization at its meeting in Geneva.

The committee set up an international standard for ACTH. This is the famous pituitary gland hormone which, like the adrenal gland hormone, cortisone, has been bringing relief to aching, crippled joints of arthritis sufferers.

Setting up an international standard gives manufacturers everywhere a single, internationally accepted measure for the activity of the substance they produce. When a doctor prescribes a dose of ACTH, therefore, he and his patient can be sure that the activity of that amount of ACTH will be the same no matter what manufacturer in what country produced the material the druggist dispenses. It will be the same, that is, if manufacturers all follow the international standard, which presumably they will.

Research workers, seeking to learn more about this antiarthritis substance, will also benefit from existence of the international standard.

International standards were set up for 15 other biological materials, including streptomycin and dihydrostreptomycin and two new antibiotic, or mold, remedies, aureomycin and terramycin. Blood-grouping serum for detecting anti-Rh factor also got an international standard.

Previously, WHO and its predecessor in this field, the Health Organization of the League of Nations, had set up 39 other biological standards.

Science News Letter, December 9, 1950

ENTOMOLOGY

Bees Have Sky Compass To Fly Bee-Line

➤ A COMPASS in the sky is the secret of how bees navigate, making the famed "beeline" a byword for straight and true flying.

The compass is polarized light, Dr. Karl von Frisch, Austrian zoologist, reveals in a book "Bees: Their Vision, Chemical Senses, and Language," (Cornell University Press). Bees, with compound eyes of many facets, somehow take their bearings from the planes of polarized light in the sky, the University of Munich professor has discovered.

The book also describes a strange dance by which explorer bees tip off the rest of the hive to a rich source of food.

In this "wagging dance," the bee runs a short distance in a straight line, meanwhile shaking its body from side to side. Then he turns and repeats the process. The number of turns tells how far away the food lies; the direction the bee takes in his dance gives the course in relation to the sun, Dr. von Frisch has found.

Toothpick-shaped organs in the bee's compound eyes apparently enable the insect to find the position of the sun even if it is hidden from direct view, the scientist believes. This organ, called an ommatidium, can measure planes of polarization in light from the sky.

Science News Letter, December 9, 1950

ANIMAL HUSBANDRY

Belgian Cows Give More Milk

➤ MILK production per cow is higher in Belgium than it is in the United States, according to a Marshall Plan report made for the Belgium Institute for Encouragement of Scientific Research in Industry and Agriculture.

Belgian cows average between 6,500 and 7,000 pounds of milk per year, whereas American cows produce about 5,000 pounds. The butter fat content, however, is lower—about 3.4% compared with 4% in the United States.

A high-producing cow is sometimes milked three times a day in Belgium. Many farms keep an official record of production by a system similar to the dairy herd improvement association method practiced in the United States.

Almost all Belgian cows are of excellent stock, with very few scrub cows, the ECA-sponsored report continued. One of the most popular breeds is a black and white Holstein-Friesian from Holland, which, surprisingly enough, is more common in the area near the French border, far from the Netherlands border.

Another popular breed, similar to the Holstein, but with red and white coloring, is found on many farms in northern Bel-

gium. A third breed is a cross between Holstein and Durham which has been developed for increased meat production. Meat is particularly important in the central, heavily populated region of Belgium.

Most Belgium dairy farms are small, particularly in the northern or Flemish region. The average farm does not exceed more than 15 or 20 acres. Practically none of the farms are restricted solely to dairy production, although milk products account for the largest part of farm income in the country, some 37%.

A large quantity of sterilized milk is produced in Belgium. The milk is bottled and heated to a temperature of 240 degrees Fahrenheit. The product is similar to evaporated milk and will keep indefinitely. One of the reasons for the popularity of sterilized milk is the fact that relatively few homes are equipped with refrigerators. In most homes, the housewives boil all their milk.

Research agencies and farmers are working hard to stamp out animal diseases, especially tuberculosis and Bang's disease.

Science News Letter, December 9, 1950

PLANT PATHOLOGY

Serious Oak Wilt Disease Spreads Out from Midwest

➤ OAK wilt, one of the most dangerous forest diseases to appear in America since blight swept the continent clear of its chestnuts, has been found in Pennsylvania for the first time.

The disease appeared near the exact geographical center of the state, in a wooded grove about 70 miles northwest of Harrisburg. It was identified by Dr. Charles L. Fergus of Pennsylvania State College and Caleb L. Morris, a state forester.

Caused by a deadly fungus, *Chalara quercina*, oak wilt was first found in 1944 in northern Illinois. The disease has since spread rapidly. Although science still does not know how it is transmitted, in six years it has struck across Illinois, Wisconsin, Minnesota, Iowa, Missouri and Indiana.

It was reported for the first time this year in Arkansas and Ohio. Its appearance in Pennsylvania, however, marks its closest approach to the Atlantic seaboard.

Whatever its manner of travel to a new locality, oak wilt can kill a tree within weeks, and it is causing forest pathologists grave concern. There is no known prevention or cure.

Dr. Fergus and Mr. Morris report that the wilt has apparently been in Pennsylvania "for several years," judging from the condition of the trees they found. They believe it probable that other areas of infection exist in the state.

The task of finding these fester spots will not be easy, they say. There are approximately 15,000,000 acres of forests in Pennsylvania, and about half the trees are oak.

Science News Letter, December 9, 1950

ANIMAL HUSBANDRY

Terramycin Puts Extra Pounds on Pigs

➤ TERRAMYCIN, newest of the earth-mold "wonder drugs," can put on an extra pound for every six that a growing pig gains.

The antibiotic was the most effective of four drugs tested as animal feed supplements, Dr. J. H. Brown of Shoemakersville, Pa., and H. G. Luther of Brooklyn, N. Y., reported to the American Society for Animal Production in Chicago.

Checked against a pen of control hogs, the swine which were fed antibiotics with their food gained more weight consistently as they grew to market size. A group fed terramycin gained 18% more weight, streptomycin brought a 15% gain; aureomycin an 11% boost, and penicillin 7%.

Less than a third of an ounce of antibiotic was mixed with each ton of hog feed. Yet this was enough to produce gains in weight as high as 50% over the control pigs during the first weeks of the 16-week experiment.

Why these wonder drugs are effective is still a mystery. The Nutrition Foundation found this year that a tenth to a third more nourishment can be obtained from food if one of the new disease-fighting wonder drugs is taken along with it. This appears to hold true for humans as well as for animals and poultry.

Science News Letter, December 9, 1950

POMOLOGY

American Apple Does Not Turn Brown in Air

➤ THE AMERICAN people as well as the Germans, (SNL, Nov. 11, p. 308) have a commercial apple whose flesh does not turn brown when exposed to the air. In 1915, the New York State Agricultural Experiment Station introduced the Cortland, an apple derived from a cross between the Ben Davis and the McIntosh.

This apple has a very white flesh that oxidizes very slowly and consequently is used extensively in salads. In fact in New York City it is known as the "salad apple." Although introduced only 35 years ago the Cortland ranks third in importance in New York State and its popularity is on the increase.

In the extensive apple breeding studies of the New York State Agricultural Experiment Station occasional nonoxidizing fruits are noted but unless they possess other attributes essential for a commercial variety they will not be introduced for general trial.

Science News Letter, December 9, 1950

THE FIELDS

MEDICINE

Aureomycin Not a Cure For Influenza Type A

➤ HOPE that aureomycin, one of the so-called mold remedies, might prove a cure for influenza, is set back by a report to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Dec 2)

Tried during an epidemic of influenza A at Fort Ord, Calif., last January, patients did not get well any faster than those given penicillin or those given no chemical treatment at all

In a different situation, with a different influenza virus than the A virus, or with the patients carrying lots of other germs in their noses and throats, which these previously healthy young men did not, aureomycin or some other antibiotic might reduce complications, it is pointed out.

The carefully controlled study is reported by Maj William G. Thalmann, Dr. C. Henry Kempe of San Francisco, Capt. Joseph A. Worrall and Dr. Gordon Meiklejohn of Berkeley, Calif.

Science News Letter, December 9, 1950

SAFETY

Retired "Tommies" Bombed In Civil Defense Training

➤ RETIRED sergeants of the British Army are willingly serving as "live decoys" for civil defense rescue team training, Dr. Herman E. Hilleboe, New York State Commissioner of Health, reported at the conference of State and Territorial Health Officers in Washington, D. C.

Actual fires and destruction of buildings are other features of the extremely real training of civil defense workers in England which Dr. Hilleboe saw on a visit there this fall.

The English method of teaching through actual experience as well as through verbal exercises is one we should follow, he told his fellow health officers.

The army sergeants bury themselves in concrete cells in the basement of the house which is to be blasted. They are made up as if they were injured, so as to give realism to the rescue work. They do not mind the dirt or danger of being bombed as long as they are protected and "find the extra money comes in handy," Dr. Hilleboe reported.

The rescuers go through a three-foot brick wall in a matter of seconds.

After a week of indoctrination, a rescue squad of eight will be alerted in the middle of the night—usually a rainy one. They look out the window and see a brick building being blown up. They have to go out

with their trucks, enter the building and listen for the cries of the injured. This is where the retired army sergeants play their parts. Sometimes trained dogs are used to help find entrapped victims.

Proper construction of shelters is stressed in England. Unless properly constructed, Dr. Hilleboe pointed out, basement shelters may become "tombs" with people left to starve to death in concrete cells with walls three feet thick.

Science News Letter, December 9, 1950

RADIO

Now Three-Dimensional Color Television

➤ THE NEWEST entry in the field of color television is a system which not only produces images in natural color but also in three-dimensional perspectives.

A patent has just been issued for a set which can turn this trick. It was invented by Thornton W. Chew, a U. S. Navy scientist who submitted his patent application just after V-J Day in 1945.

Unlike other color television methods which are based upon spinning color wheels or several electron-beam scanning rays in one set, the new system has a single projection tube with no outside mechanical adapters.

Its screen is a bank of tiny fluorescent strips, with every third strip adapted to produce one of the three primary colors, red, blue or yellow.

A single electron beam scans each color group in split-second succession, synchronized with the transmitter. Because of so-called vision persistence in the human eye, the three images produced in different colors blend to form a single natural color image.

To make certain the pinpoint beam falls on the proper color strip, magnetic lines of force act as guides within the tube. This is the secret of the new system.

Its high point is that it can be used to produce stereoscopic images, a picture seemingly in three dimensions. This is done, the inventor says, by using one color to show the picture taken by one stereoscopic camera, and another color to show the picture from a second camera. Royalty-free rights on the invention, covered by patent 2,529,485, are assigned to the U. S. government.

Science News Letter, December 9, 1950

CHEMISTRY

Peppery Chemicals Made in Laboratory

➤ SOME peppery chemicals have been made in the Quartermaster General Laboratories. They are known chemically as piperazonium salts. They dissolve in water and their pungent taste is like that of the piperine of black pepper. Details of the production of these snappy chemicals are reported in the journal, SCIENCE, (Nov. 24) by Torsten Hasselstrom, Norene E. Kennedy, Clifford E. Balmer and Harold W. Coles.

Science News Letter, December 9, 1950

AGRICULTURE

All Time Record Peanut Crop Expected

➤ PEANUTS, peanuts, peanuts. More peanuts. In fact, the Department of Agriculture reports, there will be enough peanuts grown around the world in 1950 to set an all-time record.

This is despite a lower-than-usual peanut output by U. S. farmers, who reduced their acreage by nine per cent this year at government request. The result was the smallest peanut crop since 1941 in the United States—885,700 tons as compared to 937,900 tons last year.

But in the rest of the world, booming crops were grown to satisfy the demand by humans and livestock for peanuts. All told, the Office of Foreign Agricultural Relations said, peanut production will come close to 11,400,000 tons in the shell this year, the highest on record.

Science News Letter, December 9, 1950

ENGINEERING

Sound Measurer May Give Sound-Proof Walls

➤ SOUND-PROOF walls and ceilings in hotels and apartment houses may result from investigations now under way in Cambridge at the Massachusetts Institute of Technology. Acoustical scientists of its staff have developed a sound-measuring device to record the sound that gets through various types of wall panels.

This pick-up and measuring instrument consists of a microphone to pick up the sound which gets through a panel being tested and an electronic mapping device on which the sound from the microphone is mapped in curved lines to indicate its intensity.

Together with it is employed a special sound-making device to create the noise to be directed through the panel. This sound-maker consists of 256 small loudspeakers mounted close together in 16 rows of 16 speakers each. They are operated electrically, all in unison or some quickly following others. Together they can make as much noise as a battalion of field artillery.

In use, a panel to be tested is mounted in a steel frame and set into one wall of sound-proof concrete test chamber. Noise from the sound-maker is directed against the outside of the panel. The measuring device is on the inside.

The tiny microphone is moved systematically across the face of the panel so that records are obtained of the amount of sound getting through at various positions, including at windows, studding and insulation in the panel. This sound-measuring method was first proposed during World War II by Prof. L. L. Beranek, of the M. I. T. staff, who is largely responsible for the equipment now ready for use in Cambridge, Mass.

Science News Letter, December 9, 1950

ENTOMOLOGY

Gas War on the Farm

Deadly insecticides closely related to German nerve gas has put the farmer into a gas mask. Scientists consider necessary precautions to protect him.

By SAM MATTHEWS

▶ THE HORRORS of radioactive dusts, bacteriological warfare and "nerve gases" may never become realities in human war but today in another type of war, these things are being used with deadly effect. The farmer has new weapons to fight insects, and the public gets more food and better food, through peacetime development of these wartime products of science.

Insecticides such as parathion, TEPP and HETP, members of a chemical family called the organic phosphates, are offshoots of German research in World War II into the dreaded "nerve gases."

With extremely potent effect against insect pests, the organic phosphates are among the most promising new weapons in better crop control. At the same time, food contamination due to residue hazards presents little or no danger to the consumer. The organic phosphates decompose rapidly after use on crops.

The danger is to the men who make and handle these new chemicals, the industrial workers, the farmer and the men on the spray rigs or crop dusting planes.

In the past four years, more than a dozen men have been killed by the organic phosphate insecticides. Many others have been made violently ill. Public health authorities blame most of the accidents on disregard by the victims of the need for gas masks and protective clothing. (The organic phosphates can poison the body through the lungs or the skin with almost equal suddenness.)

Bought War Surplus Masks

Many farmers bought war-surplus gas masks for use when they spray with these new organic poisons. In the past year, scientists of the Department of Agriculture have learned these masks will not stop the organic phosphate sprays and dusts.

"War surplus masks are worthless against the phosphates," Dr. Robert A. Fulton said bluntly.

To give farmers better protection, experiments under Dr. Fulton's direction have been going on since November, 1949, at the huge, sprawling U. S. Agricultural Research Center in Beltsville, Md. An Interdepartmental Committee on Pest Control (Agriculture, Public Health Service, Food and Drug Administration, Bureau of Mines, Army Chemical Corps and cooperating industrial groups) initiated the program. The first point of attack was on

parathion, first of the organic phosphates.

Dr. Fulton's job was to find respirators or gas masks able to filter out all but one part per million of the insecticide in the air passing through them. The filters had to grab and hold particles less than one-tenth of a micron in diameter. A micron is 1/1000 of a millimeter, or about 1/25,000 of an inch.

These particles of poison are too small to be detected by ordinary means. To learn whether or not his gas masks were actually catching them, Dr. Fulton used first a spectro-photometer and then live insects to do the detecting.

The spectro-photometer identifies tiny amounts of the insecticides by the effect on light rays passing through the contaminated air.

When this sensitive instrument is not sensitive enough, the chemist works with entomologists and uses specially-bred colonies of tiny aphids and spider mites. He runs sprays or dusts through his test cartridges and filters and passes the purified airstream over insects in a glass-enclosed

chamber. The number of insect deaths in a given length of time gives an accurate measure of the poison still in the air, he explained.

"From the filters we have now for parathion," said Dr. Fulton, "we think that the toughest of the new insecticides has been licked."

Specifications were set up for respirators with an intricate filter to cleanse the air drawn through them, plus chemically-activated carbon to catch any parathion which the filter misses. The government scientists then cooperated with manufacturers of protective equipment to help them meet the new requirements. This summer, the Interdepartmental Committee listed five respirators which met the safety requirements for parathion.

Dr. Fulton's next task is to find filters to handle tetraethyl pyrophosphate (TEPP) and hexaethyl tetraphosphate (HETP). His eventual goal is one canister which will handle all of the new organic insecticides.

Even as toned-down agricultural weapons the organic phosphates are extremely dangerous, Col. John R. Wood, an Army Chemical Corps doctor, reported recently in the JOURNAL of the AMERICAN MEDICAL ASSOCIATION.

In his paper he described the lethal effect



TESTED—Dr. Robert A. Fulton, Agriculture Department scientist, holds a few of the masks he has tested.



FARM WARRIOR—A special gas mask, protective clothing and rubber gloves are necessary when spraying with parathion in a greenhouse. If too much of this insecticide is breathed or absorbed through the skin, it can have the same effect as the war-developed nerve gases.

of these chemicals upon the human body as exactly similar to that of the super-secret "nerve gases."

"It seems unlikely today," Col. Wood wrote, "that chemical agents offer our potential enemies effective weapons for long-range attack . . . with the possible exception of the nerve gases." Nerve gases, he said, might well be used in a future war.

U. S. scientists found the formulas for the nerve gases and also for the organic phosphate insecticides after the Germans surrendered. Since then, official U. S. research on nerve gases and possible protection against them has been screened by an impenetrable shield stamped "Classified," "Confidential" and "Secret" and guarded by "No comment." The same is true for research into ways of protecting people against bacteriological and radiological warfare, the twin bugaboos which stand beside the hydrogen bomb in this atomic age.

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The Agriculture Department's program of gas mask research has been entirely independent of military requirements, officials are quick to point out.

But in today's paradoxical world, where the lines between gas warfare and battling insect pests has become very thin, the American farmer needs—and is getting—protection very similar to that of the U. S. soldier on the battlefield.

Science News Letter, December 9, 1950

MEDICINE

Sweet Aspirin Gives Fast Pain Relief

➤ **TESTS** showing that a sweet aspirin relieves pain faster than plain aspirin or two other aspirin preparations are reported by Dr. Murray M. Hoffman, oral surgeon, in the *ILLINOIS DENTAL JOURNAL*. (October)

Marketed under the trade name, Theryl, the sweet aspirin is a combination of aspirin and benzosulfimide, or saccharin, the synthetic sweetening substance. The new drug comes in tablets which are placed under the tongue instead of being swallowed.

Pain began to be relieved in from one-half to five minutes with the new drug, compared to 14 minutes, the fastest for any of the three others Dr. Hoffman tried. Toothaches and neuralgias (not tic douloureux) and the pain after having teeth pulled and in cases of dry sockets were among the ones Dr. Hoffman reported relieved quickly by the new drug.

Similar good results with the drug in relieving pain after surgical operations have been reported by Dr. Raymond W. McNealy. He points out in a report to the Illinois Medical Society that the results are probably due to the aspirin part of the drug which is absorbed more rapidly as a result of being combined with saccharin.

Because the drug is non-habit forming and can be taken by patients who cannot have fluids by mouth, Dr. McNealy believes it has a wide range of usefulness.

Science News Letter, December 9, 1950

PHYSICS

Atomic Age "Dog Tag" Tells Radiation Dose

➤ A SELF-DEVELOPING "atomic dog tag" for soldiers and civilians has been developed by the Army Signal Corps.

A small metal case containing photographic film and a packet of developing solution, the radiation indicator can be worn around the neck. It measures very slight to fatal doses of radioactivity from an A-bomb attack by discoloration of the film.

Science News Letter, December 9, 1950

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RESOURCES

Use of metal which can withstand heat of jet engines restricted. Non-defense use in television, radio and telephones cut 70%.

➤ JET PLANES have put the squeeze on Howdy Doody and Jack Benny. Defense needs for cobalt, a silver-white metal which can withstand the hell's fire of jet and gas turbine engines, will be felt first by makers of television and radio sets.

A cut of 70% was made by the National Production Authority in November deliveries of cobalt for non-defense purposes. Chief among these civilian uses of cobalt are special alloy steels used in making permanent magnets in television, radio and telephone receivers.

For a one-week period cobalt was frozen completely by government order. A spokesman for the Radio-Television Manufacturers Association said that without any cobalt at all, the industry would have had to shut down completely by the end of the year.

Cobalt alloy magnets are used in the electrical generators of airplane and tank engines. Mixed with beryllium and copper,

cobalt goes into the propeller hubs of piston-driven aircraft.

But the most vital use of this highly-strategic metal is in machine tools. Mixed with chromium and tungsten, it makes a material called stellite. Stellite is the stuff of high-speed, heavy-duty, high-temperature cutting tools which are harder than any steel at red-hot temperatures.

Special steel alloys are made containing

cobalt. These steels have wide uses in munitions and defense equipment.

Vitalium, an alloy containing about 65% cobalt, 30% chromium and 5% molybdenum, is used as a heat-resistant material in gas turbines and jet engines. (It is also used by dentists and doctors as a non-corrosive, electrically neutral metal for teeth fillings and surgical needs.)

Cobalt compounds are vital in making enamels stuck to metal. They are used as pigments in paint, to color glass, in livestock feeds and in nickel-plating.

The major source of cobalt in the world is the Belgian Congo. A single company, the African Metals Corp. of New York, is the only cobalt importer. In this country, only an insignificant amount is produced, although the United States is far and away the world's biggest user of cobalt.

Science News Letter, December 9, 1950

FORESTRY

Fire Fighters Needed

Machinery which will operate effectively in forests is essential. Barrier makers, tanker units to replace hand labor requirements for forest fire control.

➤ SUITABLE machinery, capable of operating effectively under the conditions existing in woodlands, is essential to modern methods of fighting forest fires, the American Society of Mechanical Engineers was told by Gilbert I. Stewart of the Michigan Forest Fire-Experiment Station.

Effective methods of controlling forest fires can be made relatively simple if machinery is employed, he said. This machinery is used to construct firelines or barriers ahead of the running fire. These barriers are built as close to the fire as possible. The machines must be built with heavy plows or other dirt-turning equipment.

Other important equipment includes tanker units with powerful pressure pumps for use in subduing the fire with water. Like the barrier builders, they must be able to travel through woods under abusive conditions. No single type of equipment can be used in all areas because forest conditions vary greatly throughout the nation.

Present general methods of fighting forest fires are satisfactory, he indicated, but suitable machinery must replace hand labor. The uses of chemicals have barely been investigated, he stated. Application of aircraft in actual suppression work is in its infancy. The helicopter faces a bright future, especially in wilderness country.

Special methods of drying lumber, which are faster than conventional air-drying or kiln-drying, were discussed at the same meeting by Harold N. Tombach, Lane Company, Inc., Altavista, Va. These processes are already in use commercially to a

limited extent but will probably find wider applications in the future.

They include vacuum seasoning drying with super-heated steam, vapor-drying, boiling-in-oil, drying with infra-red rays, dielectric heating and solvent seasoning. These special methods require more costly equipment than kiln-drying, but the decreased drying time makes a quicker turnover of lumber possible and, therefore, cuts the amount of money tied up in stocks of lumber.

Science News Letter, December 9, 1950

Fruit trees can well be used for lawn decorations and shade, and they help in the food problem.

In a special greenhouse used in connection with the development and testing of insecticides, plants are grown and also insects that kill the plants are raised.



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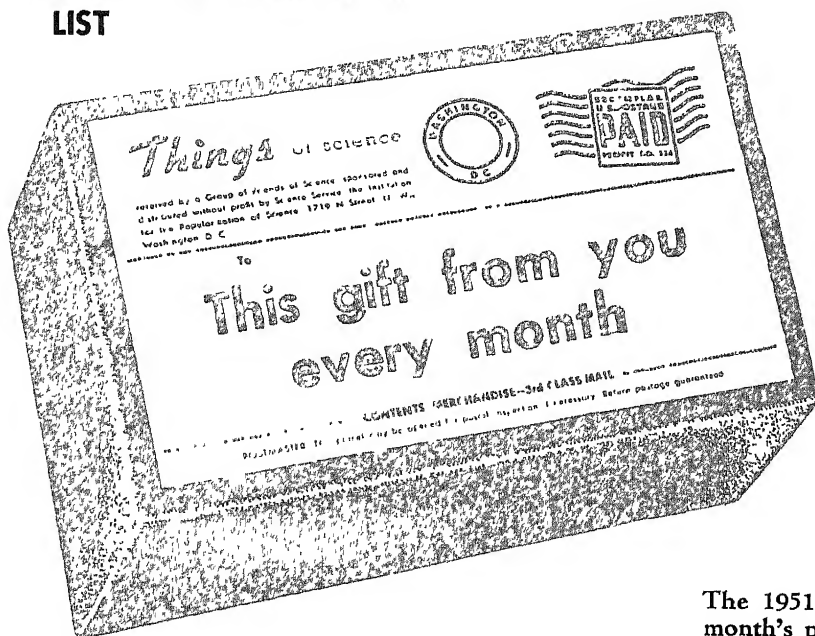
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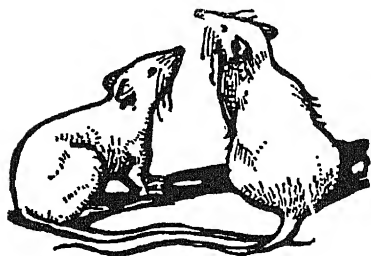
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ZOOLOGY

NATURE
RAMBLINGS

Shrews

➤ A VERY small animal with a very large nose is the shrew, whose chief fame arose when Shakespeare applied its name to women of unfortunate and trying disposition. In the eyes of many naturalists, this was grossly unfair to the shrew.

It is true that the little shrew is a nervous mouse-like mammal, addicted to burrowing and possessing both the inquisitive nature and the elongated nose needed for this prying. But in burrowing for food, the shrew performs a useful service. Shrews eat a lot of harmful insects in the ground. They also eat snails, an occasional field mouse, and many an earthworm. Few women care for these dishes, despite their dispositions.

Counted among shrews are the smallest of the world's true mammals, tiny furred

animals which do not weigh as much as a penny. Yet this minute creature can become, on occasion, one of the most ferocious beasts of the woods, pennyweight for pennyweight. When the little shrew can get food no other way, it turns to cannibalism.

Dr. C. H. Merriam, the noted mammalogist, tells of three little shrews he placed together under a tumbler. One was immediately killed and devoured by the other two. Eight hours later, a second had disappeared. The remaining shrew gave evidence of being rather well fed. It had attacked, overcome and ravenously devoured two of its own species, each as big as itself, all within a normal working day.

The shrew is a close cousin of the mole. It even looks like the mole, with small beady eyes so thickly covered with fur that people sometimes claim the animal is blind. In reality, at least one variety of shrew not

only uses its eyes while it is awake, but also while sleeping.

This is the African elephant shrew, so called because its snout is so long that it resembles an elephant's trunk. The assistant director of the National Zoo in Washington, Ernest P. Walker, has a pet elephant shrew which sleeps apparently without ever closing its eyes.

Some shrews are burrowers. Others live among the dead leaves in the forest, moving nervously about all the time. Another African variety thinks it is a kangaroo. It leaps remarkable distances to prove it.

There is a water shrew, sometimes called the "fish mouse." This amphibious creature has been seen to dive to the bottom of an aquarium, dig its long flexible nose into the sand in search of food, and literally standing on its snout, kick its feet to stay in position.

Science News Letter, December 9, 1950

• Books of the Week •

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C. Ask for free publication direct from issuing organizations.

THE A, B, C'S OF SALT AND SODA FOR SHOCK IN BURNS—*Public Health Service*, 4 p., illus., paper, single copies free upon request to publisher, Federal Security Agency, Washington 25, D. C. Rules for newly recommended method of emergency treatment of shock.

A. S. T. M. STANDARDS ON TEXTILE MATERIALS (WITH RELATED INFORMATION). Specifications, Tolerances, Methods of Testing, Definitions and Terms—A. S. T. M. Committee D-13 On Textile Materials—*American Society for Testing Materials*, 572 p., illus., paper, \$4.50.

ACCIDENT HANDBOOK—Compiled by members of the Staff of The Children's Hospital—*Children's Medical Center, Boston*, 20 p., illus., paper, 25 cents. Provides information on what to do in case of home accidents.

AIRPLANE DESIGN MANUAL—Frederick K. Teichmann—*Pitman*, 3rd ed., illus., \$7.50. An introduction to airplane design. A college text brought up-to-date.

ATOMIC BOMBING: How to Protect Yourself—*Science Service—Wise*, 186 p., illus., \$1.95. Methods for protection against the radiation and the blast of an atomic bomb are presented. Such topics as what an A-bomb will do, how to detect radiation, preventing panic, medical first aid and the history of atomic energy are discussed. Members of the staff of Science Service have written this book.

AVIATION FROM THE GROUND UP—John J. Floherty—*Lippincott*, 157 p., illus., \$2.75. A brief history of aviation.

BUTTERFLIES OF GRAND CANYON NATIONAL PARK—John S. Garth—*Grand Canyon Natural History Association*, 52 p., illus., paper, 75 cents.

THE CHEMICAL ELEMENTS AND THEIR COMPOUNDS, Vol. I & II—N. V. Sidgwick—*Oxford University Press*, Vol. 1, 853 p.; Vol. II, 848 p.; illus.; \$14.00. Discusses the proper-

ties of the elements and their compounds in the light of new ideas of atomic and molecular structure. Of British origin.

CHILDHOOD AND SOCIETY—Erik H. Erikson—*Norton*, 397 p., illus., \$4.00. Discusses the relationship between childhood training and cultural accomplishment and between childhood fear and social anxiety from the point of view of a child psychoanalyst.

CONTRIBUTIONS TOWARDS THE KNOWLEDGE OF THE MIGRATION OF BUTTERFLIES—Erik Tetens Nielsen and Astrid Tetens Nielsen—*American Museum of Natural History*, 29 p., illus., paper, 25 cents.

CULTURE IN CRISIS: A Study of the Hopi Indians—Laura Thompson—*Harper*, 221 p., illus., \$4.00. An account of this ethnic group from a multi-discipline viewpoint. The study was made for the purpose of evaluating and planning government policy.

DATE PALM INSECTS IN THE UNITED STATES—Fenner S. Stickney, Dwight F. Barnes and Peiez Simmons—*Gov't. Printing Office*, U. S. Dept. of Ag. Circ. No. 846, 57 p., illus.,

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paper, 25 cents. Contains information on the appearance and habits of date palm insects, and on methods for reducing the damage caused by them.

ELECTROPHORESIS IN PHYSIOLOGY—Lena A. Lewis—Thomas, 66 p., illus., \$1.85. Basic information on the migration of colloidal particles under the influence of an electric field in relation to physiology.

GREEN THUMB, Vol I, No. 1: Gardening in the Deep South—Frederic F. Walden, Ed-in-Chief—Green Thumb Publishers, monthly, illus., paper, \$2.50 per year, 25 cents per copy, foreign \$3.00 per year. Designed to aid the southern gardener make his home more beautiful.

GUIDE TO THE CLASSIFICATION OF FISHING GEAR IN THE PHILIPPINES—Agustin F. Umali—Gov't Printing Office, U. S. Dept. of Interior Research Report 17, 165 p., illus., paper, 40 cents.

HANDBOOK OF ANTIBIOTICS—A. L. Baron—Reinhold, 303 p., illus., \$6.50. A reference manual.

HANDBOOK OF CHEMISTRY AND PHYSICS. A Ready-Reference Book of Chemical and Physical Data—Charles D. Hodgman—Chemical Rubber Publishing Co., 32nd ed., 2879 p., illus., \$7.50. A standard reference brought up-to-date.

HEART DISEASE A Story of Progress—National Heart Institute, Public Health Service Publ. No. 17, 20 p., illus., paper, 15 cents. General information in non-technical language.

THE INCOMPARABLE VALLEY: A Geologic Interpretation of the Yosemite—Francois E. Matthes—University of California Press, 160 p., illus., \$3.75.

INDUSTRIAL PLANT LOCATION. Its Application to Zinc Smelting—Carl Hayden Cotterill—American Zinc, Lead and Smelting Co., 155 p., illus., \$5.00. Written from the viewpoint of technology, business and geography.

THE ISOCORTEX OF THE CHIMPANZEE—Percival Bailey, Gerhard von Bonin and Warren S. McCulloch—University of Illinois Press, 440 p., illus., \$8.50. A detailed study.

MODERN ABNORMAL PSYCHOLOGY. A Symposium—W. H. Mikesell, Ed.—Philosophical Library, 880 p., illus., \$10.00. A compilation of articles by leading men working in the field of abnormal psychology. Primarily a reference and source book.

THE NOMOGRAM: The Theory and Practical Construction of Computation Charts—H. J. Allcock and J. Reginald Jones—Pitman, 4th ed., 238 p., illus., \$3.75. A college text brought up-to-date. Revised by J. C. L. Michel.

POSITIVE-DISPLACEMENT PUMPS AND FLUID MOTORS—Warren E. Wilson—Pitman, 250 p., illus., \$7.50. For graduate engineers.

PLUMBING—J. T. Lendrum—Small Homes Council, University of Illinois, 12 p., illus., paper, until Feb. 1, 1951 free upon request to publisher, Mumford House, Urbana, Ill. General information for the household.

RACCOONS OF NORTH AND MIDDLE AMERICA—Edward A. Goldman—Gov't Printing Office, U. S. Dept. of Interior, North American Fauna 60, 153 p., illus., paper, 45 cents.

SURVEY OF FOOD AND NUTRITION RESEARCH IN THE UNITED STATES—1948-1949—Committee on Survey of Food and Nutrition Research of the Food and Nutrition Board—Office of Technical Services, U. S. Dept. of Commerce, 311 p., paper, \$1.75.

TV AND OTHER RECEIVING ANTENNAS: Theory and Practice—Arnold B. Bailey—Rider, 595 p., illus., \$6.00. A reference book.

TEXTBOOK OF ORGANIC CHEMISTRY—Louis F. Fieser and Mary Fieser—Heath, 741 p., illus., \$6.00. The development of fundamental principles is exactly the same as in the authors' larger book ORGANIC CHEMISTRY (See SNL, Aug. 12, 1950, p. 111) except for a few minor changes. Some topics on biochemistry, technology and reaction mechanisms found in the larger volume have been omitted in this book.

USE OF ETHYLENE IN HARVESTING THE PERSIAN WALNUT (*Juglans regia*) IN CALIFORNIA—D. G. Sorber and M. H. Kimball—Gov't Printing Office, U. S. Dept. of Ag. Tech. Bull. No. 996, 80 p., illus., paper, 25 cents.

WORLD GEOGRAPHY OF PETROLEUM—Wallace E. Pratt and Dorothy Good, Eds.—American Geographical Society, 464 p., illus., \$7.50. The nature and deposits of petroleum in the crust of the earth are discussed. Valuable contributions are written by Kirtley Mather, Geoffrey Barrow and many other well-known authorities.

Science News Letter, December 9, 1950

VOLCANOLOGY

Volcanic Eruption Covered Glacier

➤ A VOLCANO that covered a glacier during its first eruption about 35,000 years ago was described in Washington by Prof. W. H. Mathews of the University of California, Berkeley.

After erupting, Mount Garibaldi, one of a chain of volcanoes in southern British Columbia, had a portion of its cone on ice and this part collapsed when the climate warmed, he told the members of the Geological Society of America.

The volcanic cone was four and one-half miles across at its greatest size. The dome is now being destroyed by landslides, torrential streams and frost action, he stated.

Science News Letter, December 9, 1950

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• New Machines and Gadgets •

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✿ **CORN BUTTERER**, recently patented device for corn-on-the-cob eaters, is a small butter-holding box-like affair with a curved perforated lower side. Heat of the corn melts the butter while the device is moved back and forward by a convenient handle.

Science News Letter, December 9, 1950

✿ **EYE SHIELD**, for airplane pilots learning instrument flying, permits a clear view of instruments on the panel but nothing outside the plane when windows are covered with an amber plastic. The semi-circular blue plastic shield covers the face down to the mouth.

Science News Letter, December 9, 1950

✿ **NOISE METER**, developed by the Army Signal Corps, measures interference to radio or television produced by electric fans, refrigerators, automobile ignition systems and other sources. Frequency range of this new-type accurate noise meter stretches from ordinary radio to radar.

Science News Letter, December 9, 1950

✿ **MOISTURE TESTER**, to determine moisture content of wood, consists of an electric meter with battery and probing electrodes in a unit at the end of an electric cable. When the probes are pushed into a sample of wood, moisture is indicated directly in percentage.

Science News Letter, December 9, 1950

Do You Know?

Over 14,700,000 car radios are in use in America.

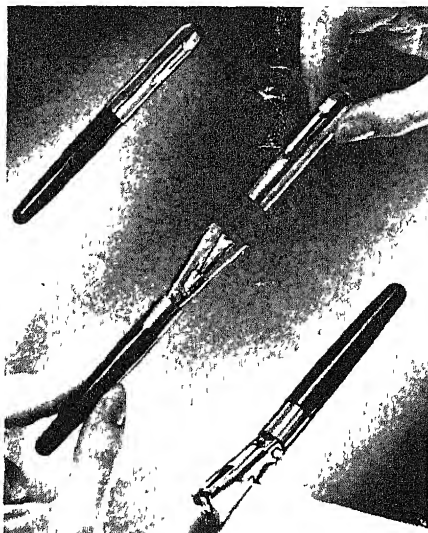
Forest fires sometimes travel forward faster than a deer can run.

More cooked dry beans are canned than any of the so-called seasonal vegetables such as peas, corn and tomatoes.

Mastitis, the most costly disease of dairy cattle in the United States, is an inflammation of the milk-producing glands in the udder.

The use of *neoprene*, a synthetic rubber, as a covering for outdoor telephone wires has cut maintenance troubles by 35%, offsetting its higher costs over older coverings.

The American steel industry now has an annual production capacity of about 100,000,000 tons; under present plans the capacity will be increased 22% by the end of 1952.



✿ **POCKET STAPLER**, designed to fasten together as many as 12 sheets of paper, is fountain-pen-size as shown in the picture, and has a removable cap equipped with a pocket clip. For operation, the chrome stapler head is grasped and squeezed be-

tween thumb and forefinger.

Science News Letter, December 9, 1950

✿ **VENDING MACHINE** for world-wide life insurance for air travelers dispenses an envelope and insurance form when a quarter is deposited in it. When the form is properly filled in it is put into the envelope with the proper amount of money to pay for the insurance desired and returned to the machine.

Science News Letter, December 9, 1950

✿ **SPECTACLE HOLDER**, a flat device which can be tucked or cemented to bathroom, kitchen or bedroom wall, is made of plastic and has two tiny pockets to hold the lenses and a center bridge on which the nose-piece rests. The legs of the eyeglasses stick out for easy grasping.

Science News Letter, December 9, 1950

✿ **DAMPENING BAG** for the laundry will hold clothes sprinkled for moining in moistened condition for days or until the housewife is ready to wash them. It is made of vinyl film, a plastic that can be welded to make a waterproof bag, and has a draw string enclosure for easy hanging.

Science News Letter, December 9, 1950



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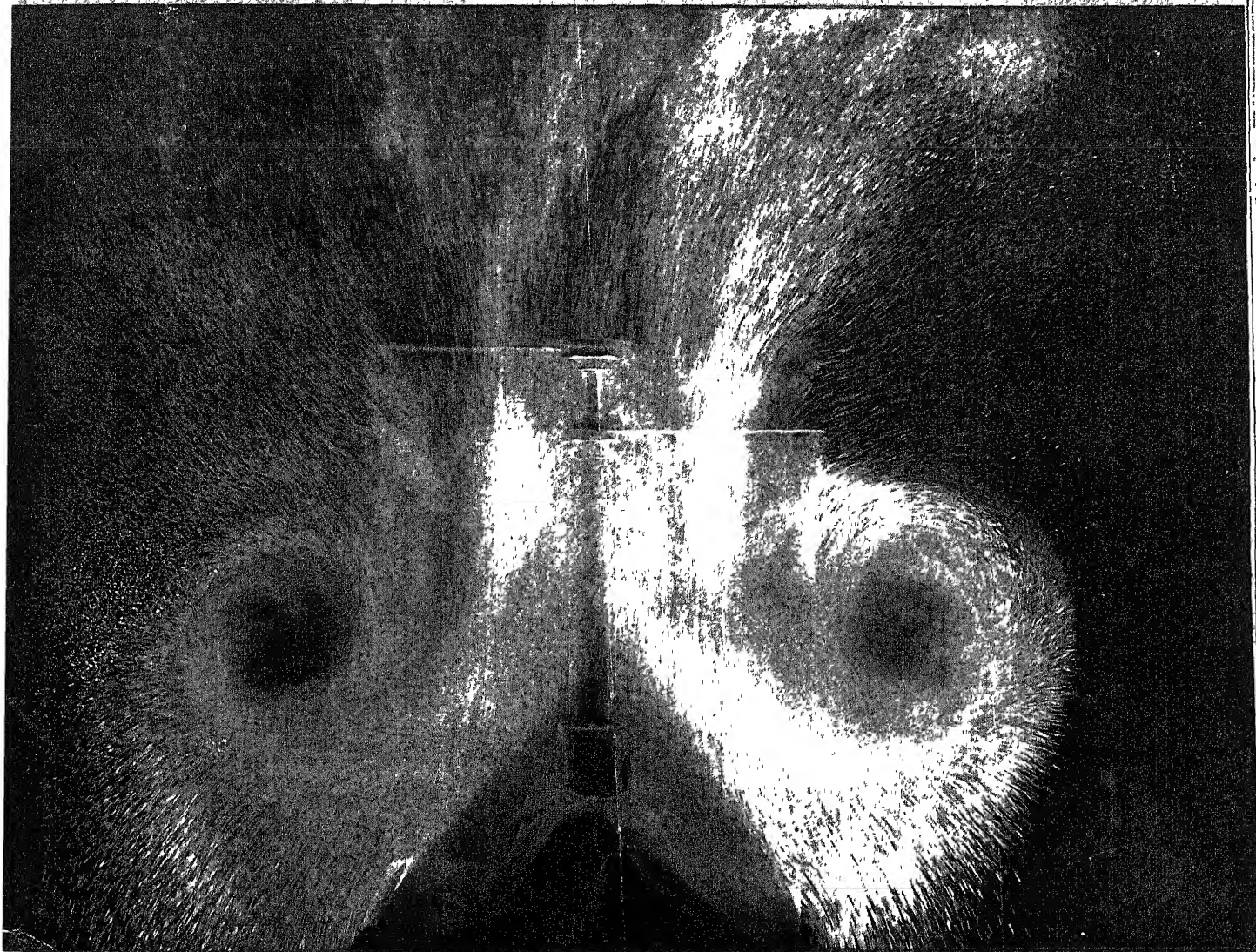
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See Page 397

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New television microphone, developed at RCA Laboratories, virtually vanishes when in active use.

Vanishing Microphone lets the stars shine

Now you see it, now you don't! RCA's new "vanishing microphone" is plainly visible when standing alone—but let a television performer stand before it and it seems to disappear.

Called the "Starmaker," this RCA microphone is little larger than a big fountain pen . . . and principles of design based on modern camouflage blend it with an artist's clothing. There's no clumsy "mike" to distract your attention from the artist—and it's also a superbly sensitive instrument.

Through research carried out at RCA Laboratories, the "Starmaker" microphone picks up sound from all directions—hears and transmits every sound the human ear can detect. It's not only small and almost invisible, but it's also one of the most efficient microphones ever devised.

See the latest wonders of radio, television, and electronics at RCA Exhibition Hall, 36 West 49th Street, New York. Admission is free. Radio Corporation of America, RCA Building, Radio City, New York 20, New York.



Known for brilliant pictures, RCA Victor's 1951 home television receivers also have the finest of sound systems—RCA Victor's "Golden Throat."



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MEDICINE

Vaccine Against Leprosy

Hope is raised that the BCG vaccine for tuberculosis may also give protection against leprosy. Individual immunity "must exist."

➤ HOPE that the BCG vaccine for tuberculosis may give some protection against leprosy was raised in a report to the American Academy of Dermatology and Syphilology in Chicago.

The report was given by Dr. Harry L. Arnold, Jr., consulting dermatologist (skin specialist) of the Honolulu Receiving Station for Leprosy and for the Kalaupapa Leprosarium, Island of Molokai, Hawaii.

The hope of vaccination against leprosy comes from a new test devised by Dr. Max Levine, chief of the Hawaii Territorial Department of Health's bureau of laboratories.

In the test, red blood cells of sheep are first treated with tuberculin extracted from tuberculosis germs. Then blood serum of the patient is added to determine at what concentration the serum will cause the tuberculin-treated sheep cells to bunch, or agglutinate.

This test, Dr. Levine has found, shows a much stronger positive reaction in positive cases of leprosy than in positive cases of tuberculosis.

The significance of Dr. Levine's findings "is not yet certain by any means," Dr. Arnold stated, "but suggests the possibility that the biologic defensive reactions against leprosy and tuberculosis may be more closely related than we have supposed."

"It lends considerable color, too, to the recent suggestions that BCG vaccination against tuberculosis may have some protective value against leprosy."

Individual immunity to leprosy "must exist," Dr. Harold M. Johnson, associated with Dr. Arnold, declared at the meeting.

"For example," he said, "four of 11 children develop leprosy with neither parent beings lepers, or a couple infected with leprosy have nine children, of whom only two are lepers."

Most patients with leprosy admitted to Kalaupapa Leprosarium have had a history of leprosy in the parents, but recently as high as 60% of patients admitted have not had a history of intimate relationship or family tie up with leprosy, Dr. Johnson reported. Infection in these cases could have occurred in early childhood, he pointed out.

The number of leprosy patients in Hawaii has gradually decreased from about 1,200 in 1890 to about 300 under treatment at present with several hundred on temporary release.

Most of the estimated three million lepers in the world are in China, India and Africa. The United States is believed to have between 500 and 5,000 unclassified and undiagnosed leprosy patients.

Science News Letter, December 16, 1950

shown to influence our ability to cope with infectious diseases, it will first have to be separated out of natural foods and will in all probability be a new, and previously unknown, addition to the list of food essentials.

"Against this day we had best maintain an attitude of skeptical waiting."

Dr. Schneider's prediction of the discovery of new resistance vitamins was made in a statement prepared for hearings before the House Select Committee to Investigate the Use of Chemicals in Food Products, of which Rep. James J. Delaney of New York is chairman.

Science News Letter, December 16, 1950

AERONAUTICS

Automatic Controls Work on Helicopters

➤ AUTOMATIC controls for helicopters, to relieve the pilot of the constant two-hands, two-foot job he now has to do, have been tested by the Piasecki Helicopter Corp. and found successful both in normal flying and in hovering.

Vertical landings and take-offs with the auto-pilot have been made, as well as complete duplication of fixed wing auto-pilot controlled flights. This means that the helicopter is now capable of "blind flying" in the worst weather conditions and can make automatic landing approaches through low weather ceilings. The device used is a Sperry production type automatic pilot already proved in both commercial and military uses.

Science News Letter, December 16, 1950

NUTRITION

One, which seems to give mice resistance to mouse typhoid fever, already traced to germ of wheat. Best plan at present is to eat well-balanced diet of natural foods.

➤ DISCOVERY of new vitamins, each giving resistance to special groups of infectious diseases, was predicted by Dr. Howard A. Schneider of the Rockefeller Institute for Medical Research.

Dr. Schneider and associates are already on the trail of one such vitamin which seems to give mice resistance to mouse typhoid fever. The substance has so far been traced to the germ of wheat. Its existence was discovered from studies in which about 55% more mice survived mouse typhoid when on a diet of whole wheat and milk than did mice on a synthetic diet of purified foodstuffs and vitamins.

The mice in these studies were of mixed inheritance, as man is. Consequently, there is a possibility that man is getting resistance

to infection from factors in his diet. But if such resistance factors exist, they are at such low concentrations that they will have to be isolated from foods and made available in concentrated form before any claim can be made that a real resistance vitamin has been found.

For the present, the "prudent course of the home diet planner," Dr. Schneider advised, "will be to continue to arrange for a well-balanced diet of natural foods with well recognized nutritional goals in view, and until we know much more it would be a waste of money to step up consumption of any nutrient, vitamin or otherwise, in the belief that an increased resistance to infection would result."

"Indeed, if any nutrient can ever be



NO HANDS—Pilot and co-pilot of this helicopter are both extending their hands to show you that the controls are being managed completely automatically.

MEDICINE

Profile System Urged

If Army classified men according to their qualifications for specific Army jobs, instead of overall standards, many rejects could be used.

➤ THE ARMED FORCES could draw on many of the 30% to 35% of men called up for draft who are now being rejected without decreasing efficiency if they instituted the profile system of classifying all potential draftees. By use of this system they could place men with minor physical and mental defects in jobs they could handle adequately.

This is the opinion of members of the committee on physical standards in the Armed Forces of the National Research Council, all of whom are doctors.

Two years ago a similar committee, set up to advise the Armed Forces, recommended to them the appointment of a high level body to study the profile system. This was not done. Therefore, the committee, which met a month ago, will shortly send another recommendation to the Armed Forces, this time much stronger.

The profile classification system entails finding out the minimum physical and mental qualifications necessary to perform each of the thousands of different jobs to be found in the Armed Forces. To take an extreme example, a man with an artificial leg might have the qualifications necessary to perform the duties of a typist—although he couldn't qualify as an infantryman.

While the committee, headed by Dr. John Stewart of the University of Buffalo, does not expect the Armed Forces to take one-legged men, it believes that many uses could be found for men now being rejected for minor physical handicaps if their capabilities were compared with job qualifications under the profile system.

Right now, if a man has one minor

physical handicap which disqualifies him for the draft, no record of his potential capabilities is kept. He is rejected and, so far as the Armed Forces are concerned, he is marked unfit to do any of the jobs in the Army, Navy or Air Force.

Selective Service Director Lewis B. Hershey has complained about the high rate of rejections in the present draft. He finds it difficult to fill the needs of the Army from the limited pool of otherwise qualified men in the 19 to 26 age bracket. Former Secretary of War Robert Patterson has spoken of the "fantastic physical standards" set up by the Armed Forces.

However, the Army, at least, is interested in the profile system. Right now experts are going over all the thousands of job classifications, fitting them with the minimum physical and mental standards necessary to fill the jobs. The Army experimented with a profile system toward the end of World War II and is classifying samples of potential draftees by the profile system right now.

The Navy and the Air Force, on the other hand, have systems of their own.

Although Army officials say that a profile system would be instituted the day total mobilization became necessary, some of them are reluctant to use it during partial mobilization. They believe it is necessary to keep standards high because the men entering service now will have to be the leaders and the teachers of men to come in under total mobilization. Therefore, they say, minimum physical and mental standards necessary to do the job are not enough.

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● RADIO

Saturday, December 23, 1950, 3-15-3:30 p.m., EST

"Adventures in Science" with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Howard Meyerhoff, Executive Secretary, American Association for the Advancement of Science, will discuss "A Preview of Christmas and Big Science Meetings of the Week."

SCIENCE NEWS LETTER

VOL. 58 DECEMBER 16, 1950 No. 25

43,500 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. Y., Washington 6, D. C., North 2255. Edited by WATSON DAVIS

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00, 3 yrs., \$14.50, single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925, 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N. Y. C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago STATE 2-4822.

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MEDICINE

Test for ACTH Dosage

Extremely accurate and effective, new tolerance test shows how much ACTH a patient can be given without bad or unpleasant effects.

► THE "first positive and foolproof test" showing how much ACTH a patient can be given without bad or unpleasant effects was announced at the ACTH conference sponsored in Chicago by Armour Laboratories, principal producer of the hormone

ACTH is one of two hormone chemicals developed within the last year and a half which bring dramatic relief in arthritis and other conditions. Cortisone is the other of these so-called miracle drugs

The ACTH tolerance test was devised by Dr. Robert S. Speirs and L. Wragg of the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Me. Trial of the test on arthritis patients at the Jewish Memorial Hospital, Roxbury, Mass., was made by Drs. Freddy Homburger and C. Bonner of Tufts College Medical School, Boston

The test depends on a relation between certain blood cells, called eosinophils, and the adrenal glands. ACTH is a stimulator of the adrenal gland. The test is made on mice that have had their adrenals removed. Samples of urine from patients getting ACTH are injected. The number of eosinophils in the mouse's blood tells whether the patient's own adrenals have responded well to ACTH and whether he has gotten enough of the hormone

The test is also believed to have useful possibilities for diagnosing various diseases, particularly those involving poor function of the adrenal glands.

Although the test is extremely accurate and effective, it must be done with completely standardized mice and very careful training. As soon as funds permit, Jackson Laboratory plans to establish a center at Bar Harbor for training teams of scientific workers to make the test with Jackson Laboratory mice.

Good for Spider Bites

ACTH, one of the two modern hormone remedies for arthritis, may be good medicine for snake and spider bites.

Two cases suggesting this were reported to the conference by Dr. Harley E. Cluxton, Jr., director of medical research for Armour Laboratories.

Both cases occurred in Savannah, Ga., where Dr. Cluxton formerly was in practice. One was that of a 32-year-old expectant mother who was bitten on the hand by a black widow spider.

Shortly afterward, she was seized with the characteristic signs of a severe reaction from black widow spider venom, including severe abdominal cramps. It was feared

that she would lose her baby. A single injection of ACTH relieved her pain, reduced the swelling and she was able to return home in a few hours, and remained in good health

The experience, Dr. Cluxton said, suggested to various Savannah physicians that the hormone might also be valuable in treating snakebite, a fairly common accident in that area, and it was decided to try it on the next case reported.

Not long afterward another woman stepped on a copperhead snake in her garden in the Savannah area and was bitten on the ankle.

The victim arrived two hours later at a Savannah hospital, where ACTH was given. The leg was swelling rapidly and was extremely painful, but the hormone stopped the pain and produced complete recovery in a few hours

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MEDICINE

Polio Risk Increased After Tonsil Removal

► A CHILD'S risk of getting polio during an epidemic is three times greater if he has

just had his tonsils removed. The risk of his getting the severe bulbar form of the disease is 11 times greater.

These figures, bearing out the suspicions of some but not all physicians, are reported by Dr. Gaylord W. Anderson, director of the University of Minnesota's School of Public Health

Details of the statistical study, made with the assistance of Genevieve Anderson, Audrey E. Skaar and Franziska Sandler, and supported by the National Foundation for Infantile Paralysis, are reported in the ANNALS OF OTOLARYNGOLOGY, RHINOLOGY AND LARYNGOLOGY (September).

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MEDICINE

Doubtful That Fatness Leads to Heart Disease

► DEFINITE evidence that overweight causes heart disease or is responsible for its earlier development is lacking, Dr. Samuel Proger of Tufts College Medical School, Boston, declared at a meeting of the American Medical Association in Cleveland.

The theory of a connection between the two is, he stated, "based upon nothing more substantial than inferences only lightly touched by logic and impressions too frail to survive critical analysis."

While there may be doubt about fatness leading to heart trouble, there is not much doubt, he said, that overweight is harmful in persons who already have high blood pressure or heart disease

The excess weight in such cases, he pointed out, is an added physical burden.

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GIANT "GEMS"—This interior view of a glass furnace looks like a mine in which huge "gems" are being cut. Actually the worker is breaking away the solidified glass to permit maintenance work on the furnace walls, a task which must be done every 30 months.

PLANT PATHOLOGY

Oak Wilt Preventive

Local spread can be stopped by cutting out infected tree, by poisoning ring of healthy trees around infected stand or by cutting interlocking roots.

➤ FOREST scientists have announced that oak wilt, rapid-spreading killer of one of America's most common trees, can be stopped in its tracks by poison or the knife.

Cutting out the first infected tree from a stand of oaks, like removing a cancer from the human body, will prevent local spread of the deadly disease, three University of Wisconsin plant pathologists said. Up to now neither prevention nor cure has been known for the blight, caused by a fungus called *Chalara quercina*.

Still a mystery, however, is the way in which oak wilt jumps great distances. Appearing little more than ten years ago in the Great Lakes area, it has already struck across Illinois, Wisconsin, Minnesota, Iowa, Missouri and Indiana. It was reported for the first time this year in Arkansas, Ohio and central Pennsylvania. Huge areas wooded in oak are threatened.

In a given stand of trees, oak wilt has been found to travel an underground route, moving from tree to tree through natural

grafts of their roots. Cut these links, Drs. A. J. Riker, J. E. Kuntz and C. M. Beckman of Wisconsin told the American Phytopathological Society, and no further infection occurs in that area.

This is done by natural barriers such as roads. It may also be done, the Wisconsin scientists learned, by poisoning a ring of healthy trees around an infected stand or by cutting the interlocking root systems with a tractor-drawn knife. Sometimes if a single wilting tree is poisoned or cut out early enough, spread of the fungus can be stopped.

Proof of the underground root path was obtained by tracing poisons, dyes and radioactive iodine. When a single tree was poisoned with sodium arsenite, five trees were killed. When these in turn were treated, 21 more trees died. Radioiodine moved from a treated tree to three others within six hours, the Wisconsin pathologists reported.

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PUBLIC HEALTH

Tighter Controls Sought

Government is seeking more power to protect the public against poisoned food now that more synthetic chemicals are used in farming and food processing.

➤ THE GOVERNMENT is making a determined bid for more power to protect the public against poisoned food.

More and more are man-made chemicals being used in farming and food processing to fight insects, plant diseases, and weeds, to fertilize, or to enhance the attractiveness and nutritional value of grocers' wares.

The Food and Drug Administration now is asking Congress for tighter controls over which chemicals can or cannot be used. Under present laws, FDA says, dangerous chemicals can creep in. Yet only when some one gets hurt can the government act.

Pure food men have asked a special House committee to recommend changes in the laws which would make food processors show in advance that their products are harmless, just as drug manufacturers are now required to do.

The committee is headed by Rep. James J. Delaney, D., of New York. Hearings were begun last August and resumed re-

cently in Washington as the committee delved into the use of chemicals in food products and farming.

Government experts and representatives of large food and chemical firms are being called to testify. Already they are arrayed on opposite sides of the fence.

The director of pharmacology of the Food and Drug Administration, Dr. Arnold J. Lehman, told the Delaney committee that his agency now has no jurisdiction to stop the widespread use of dangerous chemicals. One example, he said, is chlordane, a post-war insecticide which can be bought in common aerosol bombs at many drug stores. Yet chlordane, Dr. Lehman said, is four or five times more poisonous than DDT; it can harm the human liver and skin.

The chemical industry is opposing any change in food and drug legislation. Spokesmen say none is necessary, that adequate controls are provided by present laws.

They point to protracted hearings held

by the Food and Drug Administration this year to determine permissible residues of various chemicals used by growers of fruits and vegetables. Much of the research evidence which filled 9,000 pages of testimony, the chemical industry claims, was the work of its own scientists, who themselves check possible toxic effect of farm chemicals on consumers.

The Delaney committee is investigating a much broader field than the FDA hearings covered, however. It is studying the use of all compounds used as insect killers or fertilizers in all types of farming, as well as chemicals used in the processing of food.

The public may hark back to the mid-1930's and say, "Isn't this where we came in?" For five years, from 1933 until 1938, the Food and Drug men and the chemical-makers battled out a new pure food act.

That law specifically prohibited traffic in food which may be injurious to health. But under it, deputy Food and Drug Commissioner C. W. Crawford told the Delaney committee, the standards of what is and what isn't harmful are too loose.

The government, he said, can act against impure food products only after they go on sale, a procedure he said was unsafe.

The Food, Drug and Cosmetic Act of 1938 was the first revision of the old Food and Drugs Act of 1906. Since that time, use of chemicals in agriculture particularly have increased tremendously. In the opinion of the men who protect the public's health and pocketbook, the time has again come when more effective safeguards against poisonous foods are necessary.

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BOTANY

Christmas Flowers Kept Fresh in Freezing Locker

➤ SCIENTISTS at Cornell University have discovered that cut flowers can be preserved in freezing lockers much the same as frozen vegetables.

The conventional cold storage of blooms in cans of water delays but does not stop the flower's development. A rose cut when the petals are beginning to unfurl goes right ahead and blooms.

To be held in their just-cut state, flowers have been put in "suspended animation" at Cornell. Blooms are cut at the usual stage for shipment. They are then wrapped and sealed in cellophane to stop dehydration, and stored in near-freezing temperatures. Blooms can be held as long as a month in this manner.

At Cornell, peonies, roses, chrysanthemums, garden lilies, lilies-of-the-valley, carnations and gladiolas have been stored successfully.

Only one flower resisted the modern treatment. Like their tropical neighbors the bananas, orchids should not be kept in the refrigerator.

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PHARMACY

Antibiotics Number 141

Seven basic mold remedies are now commercially available. Production of penicillin in January, 1950, had reached 16 trillion units per month.

► THE NUMBER of antibiotic, or so-called mold remedies, now totals 141 and runs from A almost to Z. A list of them, starting with actidione and ending with Xg, has been prepared by Dr. A. L. Baron of the research division of S. B. Penick Co., one of the group of firms that started penicillin production during the early days of World War II.

At that time, in 1942, there was not enough penicillin to treat a single patient. By January, 1950, production had reached the "enormous figure of 16 trillion units per month," states Dr. Henry Welch, chief of the antibiotics division of the U. S. Food and Drug Administration.

Of the 141 antibiotics listed by Dr. Baron, there are seven so-called basic ones that are commercially available. These are penicillin, streptomycin, chloramphenicol (also known as chloromycetin), aureomycin, bacitracin, tyrothricin, and terramycin. Besides the list of these basic seven, Walter J. Derenberg,

Trade-Mark Counsel of the U. S. Patent Office, also gives a list of 80 antibiotic trade-marks registered or about to be registered as of May, 1950.

Penicillin and other antibiotics are certified by the U. S. Food and Drug Administration. This means, Dr. Welch explains, that the FDA examines each batch of the drug produced for identity, strength, quality and purity before it is shipped in interstate commerce.

The 80 trade-marks listed by Mr. Derenberg cover either a single antibiotic produced by a manufacturer, as Ledericillin which is the Lederle Laboratories name for its penicillin for human use, or a preparation containing two drugs such as penicillin and ephedrine.

The information on trade-marks and certification are given in Dr. Baron's *HANDBOOK OF ANTIBIOTICS* (Reinhold) (Listed, SNL, Dec. 9.)

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ASTRONOMY

Big American Planetarium

Made from war surplus lenses, two-ton projector under construction in California will be quite similar to famous Zeiss instruments.

► A LARGE machine for projecting synthetic stars and planets is at last being made in the United States.

Out of war surplus lenses and a war-time optical shop sometime next year will come America's first two-ton planetarium projector.

The projector will be dumb-bell shaped and quite similar in design to the famous Zeiss projectors, made in Germany before the war and in use at a half-dozen or so planetaria throughout the country. Being built under the direction of Dr. G. Dallas Hanna, the new instrument will be housed in the Morrison Planetarium, in a wing of a building now being completed at the California Academy of Sciences in Golden Gate Park, San Francisco.

Only stars and planets visible to the unaided eye will be shown by the projector. The new machine, a compound projector, is made up of 32 smaller projectors that image the stars on the planetarium dome. Two other sets of projectors are used for showing the movements of the planets, moon, sun and the earth.

Star plates for the projectors, which can be likened to slides used in home projectors, will be made of glass covered with a thin coating of aluminum. Holes in the aluminum represent stars.

A few years ago, planetaria existed only in a half-dozen communities. Today the stars are regularly "put through their paces" several times each week at no less than 13 planetaria. Zeiss and Spitz projectors are used chiefly, while the Korkosz projector, an elaborate home-made device that projects the stars but not the planets, has been performing successfully for over a dozen years at the Seymour Planetarium in Springfield, Mass.

The Zeiss projector is by far the most effective device yet produced for picturing the motions of the heavens. With this instrument the clock of the heavens can be turned back a thousand years or more.

But the Zeiss works, a war-casualty, are no longer in existence. So today Americans are making simple and complicated planetarium projectors with great success. One is being made in California, another has

reached the blue-print stage of development.

An inexpensive portable machine of great popularity today is the Spitz planetarium, used to bring stars into the classroom and even into the home. Attachments are available to show comets and meteors, eclipses of the sun and moon. Developed by Dr. Armand N. Spitz, lecturer at Fels Planetarium and educational director of the Franklin Institute, Philadelphia, this projector weighs only about 25 pounds and costs but a fraction of the price of a pre-war Zeiss.

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DAIRY SCIENCE

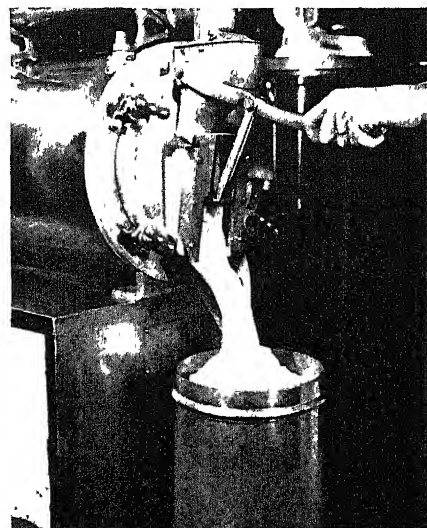
Buttermilk Used for Tastier Ice Cream

► MAYBE the pigs will not like this, but you will. Sweet cream buttermilk, dairy industry by-product that has gone to feed livestock in the past, can now be made into ice cream.

Buttermilk ice cream tastes like chocolate, vanilla, strawberry or any other flavored ice cream. It does not taste like buttermilk. Experts say it is creamier and more flavorful than ice cream made with skim milk.

Use of this material for ice cream is possible because of research by dairy scientists at the U. S. Department of Agriculture. They found a way to make sweetened condensed buttermilk which keeps. Heretofore there have not been satisfactory methods for preserving sweet cream buttermilk so that it could be stored and shipped.

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SMOOTH—This creamy ice cream is made from sweet cream buttermilk that formerly went to feed the pigs. It is made possible by a new method for preserving buttermilk so that it can be stored and shipped.

CHEMISTRY

Plastics Are Now Three-Dimensional

► NEW three-dimensional plastics were exhibited in New York. There was a stitchless quilted plastic, suitable for crib or bar, and a film of uniform thickness, with printing, color and texture on both sides. These will be available for the first time early in the new year.

Smartly-styled place mats, handbags and belts of upstanding designs attracted much attention. Undercuts such as those found in beads were exhibited in vinylite plastic. Tough, durable and resistant to abrasion, the plastic felt like the leather, cord or woven straw it simulated. Practically wrinkle-proof, repeated folding or flexing did not crack or crease the articles.

New methods of printing, embossing and forming have made these possible, it was reported by George C. Miller, vice-president of the Bakelite Division of Union Carbide and Carbon Corporation, which makes the plastic.

This preview of new developments for applying surface treatments marks another milestone in the growth and expansion of the plastic film and sheeting industry. The exhibit demonstrates that almost any fabric, pattern or weave can be duplicated in plastic; it shows that film sheeting can be styled suitably and effectively for every room in the house.

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ENTOMOLOGY

Radioactive Flies Used in Oregon Tests

► "Hot houseflies" that cannot escape scientific detection are furnishing new clues to the habits of common disease-carrying summertime pests.

Flies used for tests this summer at Corvallis, Oreg., by scientists of the U. S. Agriculture Department and Oregon state laboratories had one unusual feature. They were radioactive.

By tagging thousands of guinea-pig insects with radioactive compounds from the atomic energy plant at Oak Ridge, Tenn., entomologists were able to trace how far and how fast the "hot" flies flew from a release point. This was the first such field test of its kind, the Agriculture Department's pest control researchers report.

Baited traps as far as 12 miles away picked up the contaminated flies. Checked by a counter device, they were readily identified.

Two ways were devised for getting the radioactive tracers into the bodies of flies and mosquitoes in the Corvallis laboratory. One was to raise insects in a medium containing a compound made with radioactive phosphorus. Even more effective was to feed the insects a sugar syrup containing radioactive phosphoric acid.

By learning that flies of a particular breed are apt to spread as much as 12 miles, the scientists added to knowledge of how insects with resistance to DDT sprays appear in an unsprayed area. In other spots where DDT has killed off non-resistant flies, tougher strains from a neighboring area are apt to move in, they found.

Information of this sort is also needed on the habits of mosquitoes. With it, insect fighters can more accurately set up control zones for poisoning or draining mosquito breeding areas.

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SEISMOLOGY

New Hebrides Area Site of Big Quake

► THE vicinity of the New Hebrides islands in the Pacific has been spotted as the location of a world-shaking earthquake of Saturday, Dec. 2, that gave a big jolt to seismographs. Records collected in part by SCIENCE SERVICE from American, Samoan and Japanese stations allowed the determination of location by U. S. Coast and Geodetic Survey experts. Rated 7.6 on the earthquake intensity scale upon which 8.5 is tops, the quake may have caused tidal waves that caused damage. (Time. 2:52:03 p.m. EST Dec. 2, location 16 1/2° S 168° E., depth of focus 100 km.).

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ENGINEERING

Bottled Gas To Be Used To Power City Buses

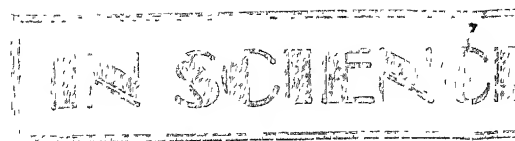
► "BOTTLED" GAS of the kind used in pressure tanks for cooking in rural homes may soon be used instead of gasoline to power city buses, Dr. Leonard Raymond of Socony-Vacuum Oil Company recently stated.

Bus operators, he said, are showing an increasing interest in the use of liquid petroleum or bottled gas as a fuel because of the rising cost of operating buses. Another reason is the availability of engines with higher compression ratio and the ready supply of bottled gas.

The idea is not entirely new. Heavy trucks, off-the-road vehicles, rail cars and industrial engines have used this type of fuel on the Pacific coast since the early thirties. One bus line in Spokane has used the gas for ten years. About three per cent of the bottled gas sold in the country is for automotive purposes.

The gas used may be either propane or butane or a mixture of the two. The principal sources are crude oil wells, natural gas wells, gas distillate wells and refinery operations. Buses can be converted at a reasonable cost. The gases have high octane number and make knock-free operation at higher compression ratios possible, giving greater power output.

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PUBLIC HEALTH

Malaria Control Gives More Food to Pakistan

► BRING malaria under control in a sub-tropical farming area, and the direct result is an increase in crop yields and a drop in man hours of work needed to farm an acre of land.

This is the finding of a study made by the World Health Organization of the United Nations in Pakistan. With widespread DDT spraying, a WHO malaria control team has boosted agricultural output of Pakistan's East Bengal province 15% in two years.

Surveys were made recently of rice fields which had been sprayed and control fields which did not get the DDT treatment. Since weather and other conditions affected both areas equally, "the 15% increase of yield in the DDT-sprayed areas, and the decrease of man hours of labor required per acre of over 10%, can be fairly attributed to the malaria control work carried out," the team leader, Dr. G. Gramiccia, reported to WHO.

In the DDT-sprayed areas, in addition, no working hours were lost due to illness. In the unsprayed control areas, there was a 2.2% loss in man hours.

This year 193 square miles were sprayed. From the health standpoint, no malaria was found in babies up to a year old in either 1949 or 1950 in the sprayed areas. In the unsprayed region, there was an infection rate of 7.1% among children of that age.

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MEDICINE

High Blood Pressure Has 60 Causes

► DOCTORS know of some 60 causes for high blood pressure. If any one of these can be found when the patient is examined, he may be helped or possibly "cured," Dr. Irvine H. Page of Cleveland declared at the meeting of the American Medical Association in Cleveland, Ohio.

"Outlook in the field today is one of optimism," he said.

Restricted diets seem to help in 30% of carefully selected cases, he said. A nerve cutting operation called sympathectomy helps many with early cases of severe high blood pressure.

Once the patient's particular type of high blood pressure has been classified, Dr. Page said, help can be given him whether through general measures or a special course of treatment.

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INVENTION

Eating Doll Bites Spoon and Swallows

➤ TO DOLLS that cry, talk, roll their eyes or walk, add an eating doll which can be fed with a spoon by its tiny "mother." It "bites" a spoon put into its mouth and "swallows" the contents.

This eating doll is one of the inventions on which the government issued a patent recently. Its inventor is Edgar Kahn of New York City. Patent number 2,531,912. Its head can be easily detached so that its "stomach" can be emptied before overfilled.

The lower jaw of this eating doll works on pivots. It has a magnet embedded in it, which is attracted to an iron spoon when inserted in the mouth. This jaw movement simulates swallowing action. A hanging tube within the body, attached to the rear of the mouth cavity, catches the "swallowed" food.

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RESOURCES

Mica Needed for Electronic Weapons

➤ IF ALL-OUT war comes, mica which the U. S. is now buying feverishly in far away India and Madagascar will be vitally needed for the electronic eyes, ears and nerves of battle.

But Uncle Sam is in a far better position in 1950, as regards this highly strategic material of war, than he was in 1940. Man-made mica, a scientific sleight-of-hand achieved since World War II, is now being made in substantial amounts in this country.

Mica is indispensable for modern electronic weapons. As an insulator, it keeps high-powered radio, radar, sonar, gun directors, calculators and all other types of electrical equipment from flashing out in one giant short circuit.

Fighting planes use mica-coated spark plugs. Mixed with new synthetic resins, mica insulates generators and protects vital delicate equipment from the weather.

Although the U. S. is the world's largest producer of natural mica, its output is limited in peacetime to powdered or scrap mica. For high grade, badly-needed "blocks" and "splittings" of mica used in electronics, this country has always had to go to India for its major supply. American firms could not compete with low-paid, highly-skilled India workers.

In World War II, substitutes were found for mica in many of its uses. Brazil began

turning out some high grade mica. So did Madagascar, Argentine and Canada. But the most far-reaching war-born development was Germany's success in making synthetic mica.

U. S. scientists, searching for years for this secret, quickly adopted the results of German research. A government-sponsored program began in 1946 at the Colorado School of Mines. Later the U. S. Bureau of Mines began work on a synthetic mica pilot plant at Norris, Tenn.

Only this year did some of the results begin to be revealed. In Colorado, cakes of mica weighing up to 500 pounds were being made by a new "cool hearth" process. Synthetic crystals superior to natural mica in resisting breakdown at high temperatures were being "grown" in mica furnaces which traveled at snail-pace under gas flame jets.

In New York State, other researchers came up with "integrated mica," huge sheets of natural mica made entirely from scrap.

Scientists were already talking of "American self-sufficiency in mica." This is not quite the case—yet. For the tremendous amounts of mica needed in an all-out mobilization and war effort, the pilot plants which now exist would not be sufficient.

But new plants could and would be given top priority. World War III would have no mica bottleneck.

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ENGINEERING

Instrument Speeds Alloy Analysis

➤ DIRECT reading of the amount of different metals in an alloy will be possible using an instrument now in the final stages of development in Paris

An improvement over present methods that require photographing, developing and then measuring, the apparatus was built by the Compagnie Radio-Cinema. It uses only two photoelectric cells to study the spectrum lines of the metals making up an alloy. American models use as many photoelectric cells as there are lines to study.

In the new model, one standard cell is stationary. The other cell, driven along the spectrum by a motor, is used to scan the spectrum of the alloy and can be stopped on any line selected for analysis. The result can be read directly by eye and is also recorded on a rotating chart at the rate of one analysis per minute.

Not only can the whole spectrum of an alloy or metal be scanned, explains Frederic D. Mathieu, director and chief engineer of the Compagnie Radio-Cinema, but also the light between the spectrum lines of elements can be measured and studied. This will be valuable for future research on alloy components. Further, the variations of the ratio of intensities of two lines can be recorded over any length of time and sparking.

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VETERINARY MEDICINE

Steel Splints on Legs Save Valuable Animals

➤ UNTIL recently most fractures in cows and horses have been considered incurable and the animals have been destroyed without further treatment.

But now broken legs in large animals may sometimes be repaired by a new technique adapted to this use by Dr. John W. Kendrick of the Veterinary Science Clinic at the University of California College of Agriculture.

"The new technique, which has been used on both dairy cattle and horses, has given satisfactory results in a high percentage of cases," he added.

Stainless steel splints are attached directly to the bone and the fractured part is encased in a plaster of Paris cast.

Such a fracture was repaired by this method in one dairy cow weighing 1,200 pounds. She calved about three months later, according to the Davis veterinarian, and by the fourth month was back in the milking string with no loss of production.

A horse whose leg was fractured in the early winter was back on the track the following year and won several races.

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RESOURCES

Feudalism Hampers Food Production

➤ DIRECTOR-General Norris E. Dodd of the United Nations Food and Agriculture Organization opened an inter-American food conference in Montevideo, Uruguay, with a blast at feudalism in the Western Hemisphere.

In the countries of Latin America, he told delegates from 25 nations, "the system of landholding and tenancy is often such as to make increased production on the part of farmers almost impossible."

Mr. Dodd said much of the discontent, revolt and revolution in the world is caused by agricultural "barriers to progress." These he listed as:

A whole family works only a tiny bit of land which it does not even own. It pays an exorbitant share of the produce to a remote landlord. Too often it is weighed down under heavy taxes or usurious interest rates for a little necessary credit.

"Such conditions," said Mr. Dodd, "must be changed if modern technology is to be given a chance to transform the lives of average human beings."

A regional FAO conference will go on for the next three weeks simultaneously with the Fourth Inter-American Conference on Agriculture called by the Organization of American States. Both Mr. Dodd and U. S. Secretary of Agriculture Charles Brannan are in Montevideo for the conferences.

Science News Letter, December 16, 1950

METEOROLOGY

Humidity and Weather

Cardboard Santa Claus Weatherman is simple weather instrument that you can make yourself. He lowers hand when weather is wet, raises it on dry days.

By MARTHA G. MORROW

► WE ALL talk about the humidity. We complain when the air is hot and humid; we rejoice when it is cold and dry.

Before leaving home in the morning, many of us take a careful look outside to see if clouds indicate rain sometime during the day.

Others check the weather forecast in the paper or over the radio before deciding whether to carry an umbrella or bother with a raincoat.

Although much detailed information must be collected throughout the country before weather experts can accurately foretell when it will rain or fog will form, a few simple gadgets can be kept around the house to indicate at a glance whether the air is dry or moist.

These home humidity indicators do not show what the weather will be like tomorrow or even later in the day, but just what it is like now. By checking them frequently, you can discover whether the air is becoming drier or more humid, and thus get a clue to the future.

Human hair is extremely sensitive to changes in humidity, altering its length to correspond with such changes. The change in length becomes pronounced when the hair's natural oils and fats are removed.

Natural blond hair that is not artificially waved and has never been dyed shows the greatest uniformity of change. A change of relative humidity from 0% to 100% causes chemically cleaned human hair to extend from 1.5% to 2.5% beyond its original length.

Use Human Hair

You can make a simple humidity indicator from a long strand of blond hair, an eyelet and pin that slips into it nicely, and two pieces of fairly stiff cardboard. A pair of scissors and a little glue are your tools.

The hair is the most important item, so make certain it is naturally blond and has never been given a permanent wave. The next time your long-haired friend has just shampooed her hair, ask permission to cut off several strands—this will save cleaning it. Get as long strands as possible and soak them for about two hours in carbon tetrachloride, then rinse in distilled water such as that used in an automobile battery, or use filtered rainwater.

To be sure the hair stays straight, dry

under light tension. Paper clips are about the right weight, so attach one to each end of the hair, being careful to touch the hair only at the ends as you work. String the hair across two well-dusted books standing upright. When dry, fold the strands in a clean piece of paper and put aside until needed.

Make Santa

Since Christmas is almost here, it would be appropriate to give your indicator a holiday motif, so make a Santa Claus—his arm will be your humidity indicator—and an evergreen tree as the background.

First sketch on cardboard a Christmas tree about ten inches high. Use a green crayon freely and paste on a few ornaments for gayety. Draw the back of a jolly Santa Claus (minus his right arm) about eight inches high, put a few toys at his feet, and color him red. Cut out in one piece.

Elsewhere on the cardboard draw Santa's outstretched arm and mark an "X" on both the arm and shoulder where the two should

be pinned together. Extend the arm beyond the shoulder a bit to give the proper counter-balance so that the arm will not be too heavy. Color and cut it out.

Use Pin

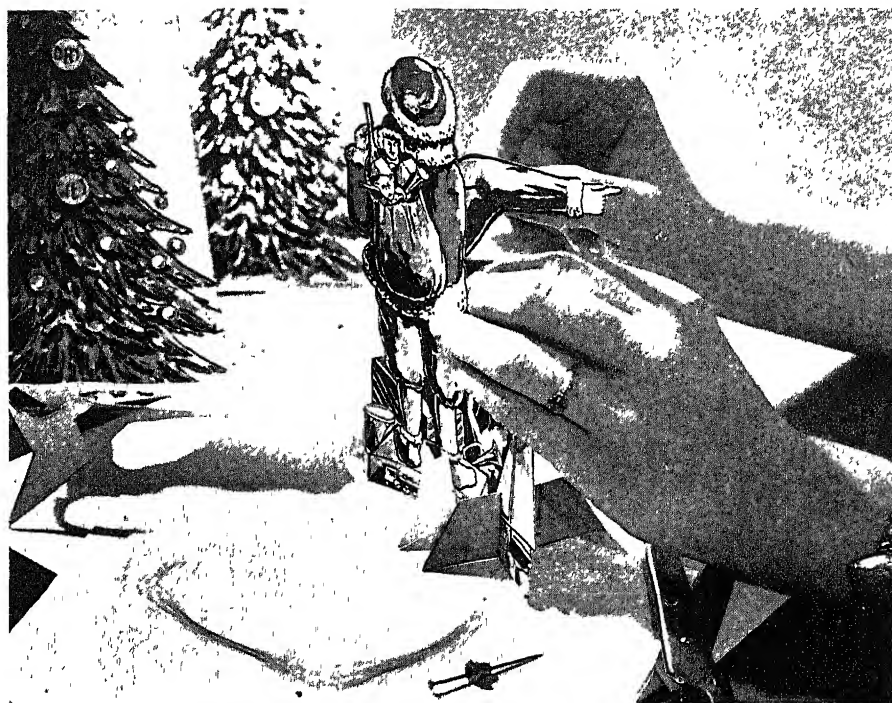
Stick a pin into the arm at "X" and work it around until the hole is just large enough for a tiny eyelet to slip into place. Run the pin through the eyelet, swing the arm around several times and notice the position of the arm when it comes to rest. It should point a bit downward. If it points upward, cut off a bit of the counterbalance; if it points straight down, add a bit.

Prop the Christmas tree from the rear so it will stand by itself. Cut out two cardboard strips to hold Santa and the tree together, making two thin slots about a half inch apart in each base, in the tree and in the toys at Santa's feet. Fit Santa into the base so he will stand up.

Now work with the hair. Grease and perspiration from your fingers, even though you may have just washed them, will keep the hair from reacting effectively, so hold the hair only at the ends. Remove the eyelet from the arm, and from the uncolored side thread a single hair through the hole in the cardboard, letting about half an inch of hair come through.



AGAINST DAMPNESS—Moisture-indicating pellets are used in caps for up-to-the-minute salt shakers and cookie jars. Granules which change color with humidity are sealed in moisture-proof containers for machine parts and scientific instruments.



PUTTING SANTA TOGETHER—Notice particularly Santa's arm properly counterbalanced. The pin is run through Santa's shoulder, then through the eyelet which acts as a bearing to help the arm swing freely.

Push the small end of the eyelet into the hole from the side you colored. Wind the hair under the head of the eyelet and push firmly into place. Glue the cardboard and eyelet together by placing a speck of glue behind the eyelet head. Let dry thoroughly.

Stick the pin into Santa's shoulder, then through the eyelet. Hold the hair by its loose end, tug a bit to be sure it is anchored securely, and wind twice around the part of the eyelet extending from the back of Santa's arm, winding clockwise (the way the hands of your clock turn). Bring the hair down to the base and anchor firmly by slipping it into a tiny slit cut in the cardboard base beneath the arm; pull the hair just enough for the arm to extend straight out from the body.

Slip the Christmas tree into place behind Santa Claus. Push the pin from Santa's shoulder and arm into the cardboard at one side of the tree. Check the hair and arm arrangement. The hair should touch nothing from the place where it leaves the eyelet until it fits into the slot at the base: be sure it is not wrapped around the pin. Slip the eyelet along the pin until the arm hangs free and about an equal distance from Santa and the tree.

Now Test

Now test your hair indicator. Place it on a shelf, windowsill or some other safe place in the bathroom, close the window and door firmly, and run piping hot water into the tub or shower. The cut-out was designed

so that as the humidity increases and the hair from the eyelet to the base becomes longer, the pointing arm would swing down. Mark on the tree the place where the hand points for 100% humidity such as you have when the mirror becomes fogged. The next time the air is extremely dry, mark the place on the tree to which the hand points, and your indicator is complete.

Change Color

Humidity may not only be indicated by a physical change such as elongation of a strand of hair, but also by a chemical change like a difference in color. Cobalt chloride, sometimes used as "magic ink," changes from a deep blue to pale pink as it becomes more moist. A dark blue when dry, it becomes a light blue at 20% relative humidity, lavender at about 30% and pink at 40%.

Silica gel and alumina, both of which readily pick up moisture from the air and cling to it until the moisture is driven out by heat, are used as carriers for the tell-tale cobalt chloride. When so much moisture has been absorbed that they appear quite pale, the granules or pellets are placed in a warm oven and the moisture driven off until they are once again quite blue.

Salt-shaker caps containing pellets of alumina impregnated with cobalt chloride will be a favorite Christmas item this year in some areas. Salt will pour freely until the pellets turn pink; dried out in the oven

the protective pellets are ready to go to work again. Likewise up-to-the-minute cookie jars have caps containing pellets that catch the moisture and signal when they need to be dried out.

Silica gel impregnated with cobalt chloride is helping our troops overseas. Sealed in moisture-vapor-proof containers for machine parts and scientific instruments, they make sure the contents reach our soldiers and sailors factory fresh, free from rust and corrosion, mildew and mold. These same granules played a large part in preserving our "mothball fleet" so it would be ready for service when needed. Since rust and corrosion do not occur in atmosphere containing less than 30% relative humidity, the tell-tale color indicates a dangerous leak or tear in the transparent packaging or wrapper.

Santa Claus, with a properly counterbalanced arm, has been worked out for you by Science Service. For the nominal fee of 50 cents you will receive the two drawings on cardboard, processed human hair, pin and eyelet needed to make your own humidity indicator, as well as some granules that change color with moisture. Just write Science News Letter, 1719 N St., N.W., Washington 6, D. C., and ask for the kit on Humidity.

Science News Letter, December 16, 1950

PALEONTOLOGY

Fossils of Wyoming Like South American Fish

➤ IN DIM ages 55,000,000 years ago, when vast areas of North America were lakes, the western plains were the homes of fish now found only in the Southern Hemisphere, Smithsonian Institution scientists report.

"Important discoveries" of ancient fish fossils were made this summer at the Green River formation near Fossil, Wyo., by Dr. David H. Dunkle of the Smithsonian and Dr. Bobb Schaeffer of the American Museum of Natural History.

The paleontologists found fossils of fish very similar to those caught in the Great Lakes today. Other specimens, however, showed that the lakes which covered parts of what are now Wyoming, Colorado and Utah were once quite warm.

"There is no reason to believe," Dr. Dunkle said, "that the climate differed materially from that found in the region today. During so long a period as 6,000,000 years (while the lakes existed), there naturally would be many fluctuations in climate with extended periods when the water would be fairly warm."

The prehistoric lakes, probably two in Wyoming and one covering western Colorado and northeastern Utah, were surrounded by volcanic mountain ranges. Eruptions showered volcano ash into the lakes, killing fish in great numbers. The fish settled into the mud, sand and ash of the lake bottoms and their remains were into shale and sandstone fossils.

Science News Letter, December 16,

ARCHAEOLOGY

Oldest Houses Unearthed

Pinto houses, built more than 3,000 years ago of wooden posts interlaced with wattlework of reeds and twigs unearthed near Little Lake, California.

► **UNEARTHING** of three of America's oldest houses—probably constructed more than 3,000 years ago—has been reported at the foot of the Sierra Nevada, 60 miles north of the town of Mojave, Calif.

Dr. George W. Brainerd, associate professor of anthropology at the University of California at Los Angeles, finds the houses are undoubtedly among the oldest known in the New World.

Working in the Stahl site near Little Lake, California, with his associate M. R. Harrington, research associate at U.C.L.A. and curator of the Southwest Museum in Los Angeles, Dr. Brainerd has stated that the area is one of the richest archaeological sites in southern California.

The ancient houses are constructed of wooden posts driven into the ground and interlaced with a wattlework of reeds, twigs,

etc., possibly plastered with mud for weather-proofing. Its roof probably corresponded with other flat roofs in western North America.

Architects of the period apparently stuck to no general style. Each of the three houses varies slightly in shape, two being rectangular while the third is round. Traditionally, the skin-covered doorways opened to the east.

Indians living in these houses were of the Pinto Culture, which thrived prior to 1,000 B.C.

Many of their implements have been found in the diggings, including well-shaped obsidian spearheads (they had no bows and arrows), knives, grinding stones, skinning and scraping tools and partially fossilized animal bones—such as native American camels and horses, now extinct.

Science News Letter, December 16, 1950

CHEMISTRY

Synthetics Satisfactory

Substantial savings in production costs and improved operation of machines possible through use of synthetic lubricants instead of petroleum products.

► **SYNTHETIC** lubricants, instead of petroleum products, have been found satisfactory in certain industrial applications, and their use is recommended because of superior qualities and the saving of petroleum for other purposes.

Substantial savings in production costs and improved operation of mechanical equipment are possible through the substitution of synthetic lubricants for petroleum products in certain industrial applications, the American Society of Mechanical Engineers was told.

C. H. Sweatt and T. W. Langer, Union Carbide and Carbon Corporation, presented a paper stating that these synthetics are particularly valuable where unusual and severe operating conditions are present. In addition to use as lubricants in the ceramic, dairy, metal working and rubber industries, they are finding applications as antifoaming agents, in nylon, glass, wool and rayon fibers, and as a substitute for oil in printing inks.

The polyalkylene glycols and their derivatives constitute one class of synthetics differing considerably from petroleum products in physical and chemical properties,

they said. These lubricants range in consistency from very light to highly viscous liquids. Some are water soluble while others are not.

Properties of these lubricants include excellent anti-wear action, good load-carrying capacity, favorable viscosity-temperature relationships, low stable pour points, little or no solvent and swelling effect on either natural or synthetic rubber, and stability at elevated temperatures.

Science News Letter, December 16, 1950

ASTRONOMY

No New Stars in Small Magellanic Cloud

► **NO NEW** stars will be born in the small Magellanic cloud, Dr. Harlow Shapley, director of Harvard College Observatory, predicts.

The large Magellanic cloud, however, will continue to give birth to stars.

These Magellanic clouds of hundreds of thousands of stars look to the naked eye like detached portions of the Milky Way.

They are so far south they are never seen from the United States.

Recent theories of star origin make cosmic dust the building-material for supergiant stars such as commonly are found in the large cloud. In its central regions the Greater Magellanic Cloud is so rich in the pre-star stuff that the light of more distant objects is scattered and absorbed to the extent of one magnitude or more.

But the small cloud is almost completely free of interstellar dust and gas. Here the epoch of star birth has passed, Dr. Shapley stated at the meeting of the Harvard Observatory's Visiting Committee. This report marks the completion of the first quantitative measure of a galaxy's content of dust and gas from which its future stars may be born.

The large angular diameters of these two Magellanic clouds, nearest of external galaxies, made it possible for Dr. Shapley and his associates to complete a survey in and around the clouds. The frequency of the more distant galaxies was found, and from their numbers the transparencies and the amount of light-scattering material calculated.

Between galaxies, space is essentially clear of absorbing material, but in our own Milky Way galaxy there is much of this star-stuff. Its study is one of the main topics of modern astronomical research.

The so-called Great Rift in the Milky Way is caused by such material, which is so heavy near the Milky Way plane that it blocks our view of remote parts of our own galaxy. Of the billions of outside galaxies, only the two Magellanic clouds of the southern sky cover large enough areas of the sky to use these statistical methods of "translucent" galaxies employed by the Harvard astronomers.

Around the large cloud, for example, down to magnitude 17.5, about 30 galaxies are found in each square degree, indicating complete transparency. But in the axis of the cloud and in its central "deserts," only three or four galaxies per square degree are able to shine through.

Science News Letter, December 16, 1950

MEDICINE

Surgery Is Only Cure For Lung Cancer

► **"THE ONLY** possible chance of cure" of lung cancer is by surgical removal of all or part of the lung, Dr. Brian Blades, chief of surgery of George Washington University Hospital, Washington, D. C., declared at the meeting of the American Medical Association in Cleveland, Ohio.

Of all deep cancers in the body, the possibility for surgical cure is probably best in the case of lung cancer, he said. Lung cancer is one of the commonest forms of cancer and apparently is increasing.

Science News Letter, December 16, 1950

ENGINEERING

Magnetic Fluid Brakes

Principle developed for automobile clutches has been applied to new type of brakes operated by a push-button attached to steering gear.

► **THE THUMB**, not the foot, may operate the automobile brakes of the future. The magnetic fluid principle developed at the National Bureau of Standards for automobile clutches has been put to work at Rensselaer Polytechnic Institute in Troy, N. Y., in a braking device operated by the flow of an electric current.

The magnetic fluid developed by Jacob Rabinow some three years ago at the National Bureau of Standards uses an oil containing iron dust. When a magnetic field is applied to the mixture, the iron particles are magnetized. They then tend to stretch out lengthwise between the plates of the electromagnetic field and solidify the mixture.

Since the discovery of the magnetic fluid,

several important uses for it have been developed. Among them is in so-called servomechanisms, automatic devices for control purposes, including in airplanes. Other uses are in shock absorbers and recoil mechanisms.

In the Rensselaer automobile brakes, a very light oil saturated with iron dust of a smooth grain type is used. It forms a liquid ribbon only one twenty-fifth of an inch thick between the brake rotor and the outside drum in which a magnetic coil is embedded. Current to activate the coil is controlled by a push button on the steering wheel. The brake takes hold smoothly and its power increases as the magnetizing current is stepped up.

Science News Letter, December 16, 1950

PLANT PATHOLOGY

Excess Acids Weaken

Amino acids linked to proteins in all living organisms, when they exist in excess in fungus-susceptible plants, have weakening effect.

► **A CLUE** has been uncovered to one of the unknown factors which make some plants more resistant to deadly fungus diseases than others.

With his study of black-rot diseases of tobacco, Dr. Robert A. Steinberg of the Department of Agriculture's plant research station believes that a poisoning process

may be one key to this major biological mystery.

Certain amino acids, the physiologist found, seem to pave the way for the destroying fungus. Amino acids are vital substances linked to proteins in all living organisms. They play an important part in human nutrition, with more than 20 of them now known to science.

When some of these acids exist in excess in plants, Dr. Steinberg learned, they have a weakening effect on disease-susceptible plants, more so than on resistant varieties. One acid in particular is deadly. It was found to be lethal to tobacco seedlings at strengths as low as five parts per million.

In testing various of the amino acids with no disease organisms present, Dr. Steinberg discovered that they hit hardest at young tobacco plants which were known to be susceptible to black rot. Hardier strains of tobacco were affected least by the acids.

If it can now be shown that the fungus which causes a disease produces an excess of toxic acids in the plant system, a long step will have been taken toward better understanding of these diseases.

Sometimes completely ruining a farmer's crops in a short time, the fungus diseases

can be fought by chemicals. But the only permanent defense is the work of plant breeders who cross and recross strains to produce plants with built-in resistance against disease.

Science News Letter, December 16, 1950

AERONAUTICS

Balsa Wood Dust Shows Air-Flow Pattern

See Front Cover

► **FINE DUST** from the lightweight wood known as balsa is being used in laboratories of the National Advisory Committee for Aeronautics to make movements of air visible in investigations concerning air-flow.

Its first use was in studying helicopters. The trend toward increasing the size and load capacity of helicopters has resulted in increased use of multiple-rotors. In order to study air patterns resulting from such rotors, this so-called NACA balsa-dust technique was developed.

The method, according to a recent report by the NACA, has provided a simple means of observing the flow distribution through model rotors and is suited for many other applications in which a pictorial representation of the air-flow pattern in a given plane is desired.

With this material still photographs and motion pictures of air-flow can be taken. One is shown on the cover of this week's SCIENCE NEWS LETTER. Other materials, including smoke, were tried. The finely divided balsa particles were found to provide the best combination of high reflectivity and low mass of any of the materials investigated.

The report, NACA Technical Note 2220, was prepared by Marion K. Taylor, Langley Aeronautical Laboratory, Langley Field, Va., where the method was developed. The balsa-dust method of air-flow visualization is simple to use, the report states, and requires only a supply of balsa wood, a camera and photographic lights.

Science News Letter, December 16, 1950

About 40% of the land area of the United States receives too little rainfall for safe general agriculture.

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BEES Their Vision, Chemical Senses and Language—Karl von Frisch—*Cornell*, 119 p., illus., \$3.00. The text of three lectures given at Cornell University, the American Museum of Natural History and the University of Minnesota by the author during the spring of 1949. (See SNL, December 9, p. 376).

CHEMICAL THERMODYNAMICS Basic Theory and Methods—Irring M. Klotz—*Prentice-Hall*, 369 p., illus., \$6.00. A college text designed primarily for chemists.

COLOR ATLAS OF PATHOLOGY (Hematopoietic System, Reticulo-Endothelial System, Respiratory Tract, Cardiovascular System, Liver Alimentary Tract, Kidney and Urinary Tract and Musculoskeletal System)—U. S. Naval Medical School—*Lippincott*, 546 p., illus., \$20.00. A reference work with reproductions in full color for the student, the clinician and all those connected with the medical profession.

CRIME CAUSATION Selected Bibliography of Studies in the United States 1939-1949—Otto Pollak, Compiler—*University of Pennsylvania Press*, 53 p., paper, \$1.50.

DIFFERENTIAL DIAGNOSIS OF INTERNAL DISEASES Clinical Analysis and Synthesis of Symptoms and Signs—Julius Bauer—*Gruene and Stratton*, 866 p., illus., \$12.00. A text for an advanced course in diagnosis.

DISEASES OF CEREALS AND GRASSES IN NORTH AMERICA (Fungi, Except Smuts and Rusts)—Roderick Sprague—*Ronald*, 538 p., illus., \$7.00. A monograph concerning the fungi occurring on members of the grass family.

FOR THE DEAN Essays in Anthropology in Honor of Byron Cummings on His Eighty-Ninth Birthday, September 20, 1950—Erik K. Reed and Dale S. King, Eds.—*Hohokam Museums Association and Southwestern Monuments Association*, 318 p., illus., \$6.00. Former students of Dr. Cummings combined to write a volume on Southwestern anthropology.

THE FRESH-WATER ALGAE OF THE UNITED STATES—Gilbert M. Smith—*McGraw-Hill*, 2nd ed., 719 p., illus., \$10.00. A reference book brought up-to-date. Many genera and species have been added to this edition.

FREUD OR JUNG—Edward Glover—*Norton*, 207 p., \$3.50. A Freudian compares the theories of Freud and Jung.

HIGHWAY RESEARCH BOARD Proceedings of the Twenty-Ninth Annual Meeting—Roy W. Crum, Fred Burggraf and W. N. Carey, Jr., Eds.—*Highway Research Board*, 620 p., illus., \$7.50. Includes the papers given at the annual meeting in Washington, D. C., Dec 13-16, 1949.

THE INITIATIVE AND REFERENDUM IN OREGON: 1938-1948—Joseph G. LaPalombara—*Oregon State College Press*, 137 p., illus., paper, \$1.00. A monograph on some policy-making processes.

KOREA: An Annotated Bibliography of Publications in Western Languages—Helen Dudenbostel Jones and Robin L. Winkler, Compilers—*Library of Congress*, 155 p., paper, \$1.10. Includes about 750 publications in all fields with emphasis on works published since 1930.

THE MARINE ANNELIDS OF OREGON—Olga Hartman and Donald J. Reish—*Oregon State College Press*, 64 p., illus., 75 cents. A monograph on the distribution of this particular phylum of worms.

MEET THE SCIENCES 1900-1950: A Half Century of Good Science Reading—Science Committee, New Jersey Library Association—*New Jersey Library Assn.*, 3rd ed., 6 p., paper, 10

cents. Provides the general reader with an over-all selective guide to the background works on science.

MUNICIPAL AFFAIRS—Ernest W. Steel—*International Textbook Company*, 2nd ed., 377 p., illus., \$5.50. A new edition of a book combining city government fundamentals with the treatment of city administration.

THE NEW YOU AND HEREDITY—Amram Scheinfeld—*Lippincott*, 616 p., illus., \$5.00. Some of the latest findings regarding human inheritance are presented. This book follows **YOU AND HEREDITY** written by the same author ten years ago.

THE 1950 YEAR BOOK OF OBSTETRICS AND GYNECOLOGY (August, 1949—July, 1950)—J. P. Greenhill, ed.—*Year Book Publishers*, 570 p., illus., \$5.00. Presents advances made in obstetrics and gynecology during the past year.

OPERATIONAL CALCULUS Based on the Two-Sided Laplace Integral—Balth. Van der Pol and H. Bremmer—*Cambridge University Press*, 415 p., illus., \$10.00. An advanced mathematics text of British origin.

PHYSICAL EDUCATION IN THE SCHOOL CHILD'S DAY—Simon A. McNeely and Elsa Schneider—*Gov't. Printing Office*, Federal Security Agency Bull. 1950, No. 14, 94 p., illus., paper, 30 cents.

POPULATION GENETICS AND ANIMAL IMPROVEMENT: As Illustrated by the Inheritance of Egg Production—I. Michael Lerner—*Cambridge University Press*, 342 p., illus., \$5.50. A mathematical presentation. Of British origin.

PRACTICAL NURSING CURRICULUM Suggestions for Developing A Program of Instruction Based Upon the Analysis of the Practical Nurse Occupation—Arthur B. Wrigley, Director of the Study—*Gov't. Printing Office*, Federal Security Agency Misc. No. 11, 140 p., illus., paper, 65 cents.

PROBLEMS OF CYTOLOGY AND EVOLUTION IN THE PTERIDOPHYTES—I. Manton—*Cambridge University Press*, 316 p., illus., \$8.50. An advanced college text on ferns. Of British origin.

PROGRESS IN GYNECOLOGY, Vol. II—Joe V. Meigs and Someis H. Stutgis, Eds.—*Gruene and Stratton*, 821 p., illus., \$9.50. Some of the latest advances in the field of gynecology are described.

REPORT OF THE COMMITTEE ON THE MEASUREMENT OF GEOLOGIC TIME 1949-1950—John Putnam Marble, Chairman—*National Research Council*, 118 p., paper, \$1.00. Presents an analysis of the methods for absolute measurement of geologic time and allied subjects received by the committee during the last year.

SELECTED PROCEDURES IN TEACHING BIOLOGY—E. Irene Hollenbeck and Elmo Nall Stevenson—*Oregon State College Press*, 57 p., paper, 75 cents.

SKULL FRACTURES AND BRAIN INJURIES—Harry E. Mock—*Williams and Wilkins*, 806 p., illus., \$13.50. A general surgeon presents his personalized, practical approach to this field of medicine.

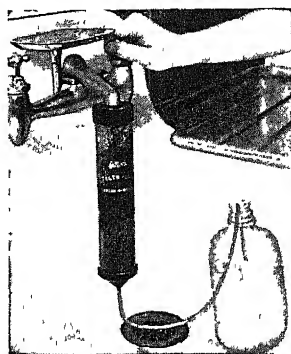
SPECIES OF SELENOPHOMA ON NORTH AMERICAN GRASSES—Roderick Sprague and A. G. Johnson—*Oregon State College Press*, 43 p., illus., paper, 75 cents.

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THE STORY OF MOUNTAINS—Ferdinand C. Lane—*Doubleday*, 488 p., illus., \$6.50. A description of the mountains in the world. Profusely illustrated with full paged black and white photographs.

STUDIES IN LOBOTOMY—Milton Greenblatt, Robert Arnot and Harry C. Solomon, Eds.—*Gruene and Stratton*, 495 p., illus., \$10.00. A monograph on an important brain operation.

UNITED STATES ATOMIC ENERGY COMMISSION RADIATION INSTRUMENT CATALOG—AEC Radiation Instruments Branch—*AEC Technical Information Service*, (Distributed by Office of Technical Services, U. S. Dept. of Commerce), Catalog No. 2, Parts 1 & 2, unpagged, illus., paper, \$2.00 for both parts. A catalogue of commercially available radiation instruments.

THE URINARY FUNCTION OF THE KIDNEY—A. V. Wolf—*Gruene and Stratton*, 363 p., illus., \$7.50. A monograph discussing many of the latest developments in renal physiology and related fields.

VARIABILITY OF AGRONOMIC AND SEED COMPOSITIONAL CHARACTERS IN SOYBEANS AS INFLUENCED BY VARIETY AND TIME OF PLANTING—Martin G. Weiss and others—*Gov't Printing Office*, U. S. Dept. of Ag. Tech. Bull. No. 1017, 39 p., illus., paper, 15 cents.

VERTICAL FARM DIVERSIFICATION—D. Howard Doane—*University of Oklahoma Press*, 183 p., illus., \$2.75. Methods of grading, processing and direct selling are presented.

WHERE CHILDREN LIVE AFFECTS CURRICULUM—Effie G. Bathurst—*Gov't Printing Office*, Federal Security Agency Bull. 1950, no. 7, 77 p., illus., paper, 25 cents. The author suggests curricular improvements for different parts of the country.

Science News Letter, December 16, 1950

PUBLIC HEALTH

Tattooing May Spread Virus of Jaundice

➤ **WARNING** to sailors and other servicemen: Think twice before getting tattooed. You may get a liver inflammation with jaundice from the tattooing.

Among 26 enlisted men in the hospital in Panama City with this jaundice, 18 had been tattooed in Panama City, 17 at the same place, and all of them within the time it takes jaundice to develop after virus gets into the body. The cases are reported by Dr. Baillard F. Smith, now at the Veterans Administration Hospital in Buffalo, N. Y., (*JOURNAL, AMERICAN MEDICAL ASSOCIATION*, Dec. 2).

After seeing these cases, Dr. Smith investigated further and became convinced the jaundice virus was being spread with the tattoo needle and dye. All tattooing was ordered suspended in Panama City and Colon until the operators had been instructed in more hygienic methods. After that, two establishments on the Pacific side and one on the Atlantic side of the Canal Zone reopened and followed the approved procedure.

Science News Letter, December 16, 1950

BOTANY

NATURE RAMBLINGS



Christmas Trees

➤ **THIS** is the season when 28,000,000 little trees are brought into 28,000,000 unseasonably warm front parlors and loaded down with enough tinsel, twinkling balls and colored lights to build a glittering highway from earth to the moon.

The little evergreens never flowered when they grew out of doors. Suddenly they sprout bright candles or complete electric systems for blossoms. Apples, oranges and candy canes appear in their boughs in a burst of fruit. It takes real magic for such things to occur. But this is a time of benign magic.

Christmas trees, like many other things which decorate homes at Yuletide, are older than Christmas itself. They were first used in lands far from Bethlehem. They belong to the North, to dark and savage lands beyond the Rhine and the Danube.

The favorite Christmas tree in America is the spruce. There are several types of spruce, but they all can be spotted by their short, sharp, prickly needles, each one standing on a miniature pedestal by itself. Their small cones hang downward.

Then there is the fir, close cousin of the spruce. Firs have softer needles, usually curved, and their cones stand straight up.

Pine trees, often used at Christmas, can be told from spruce or fir by the fact that their needles come in bunches or pairs instead of singly. White pines always have five needles in a bunch. The various yellow pines have less than five—usually two.

Red cedar has very fine, feathery branches of small pointed leaves. *Arbor-vitae*, a relative of the red cedar, has leaves flattened into tiny scales which completely cover the twigs on which they grow.

Gigantic is the merchandising machine which brings millions of these trees from mountain forests to city street corners, all within the brief month between Thanksgiving and Christmas Eve.

Yet only in rare instances does this mighty splurge of woodland cutting hurt the forest. If the Christmas tree marketer cuts selectively, his thinning helps the remain-

ing trees to grow, trees which might otherwise have died from crowding.

Many families do not buy a cut tree at all, but instead a small spruce or fir planted in a tub. They use this as a perennial Christmas tree, bringing it indoors each December, sinking the tub in the garden during the remainder of the year. Children and tree grow together, until one day the parlor ceiling is suddenly too low. The magic still lives, but the tub is outgrown.

Science News Letter, December 16, 1950

NUTRITION

Bottled Pancakes Soon From the Milkman

➤ **FIVE** new or newly-packaged dairy products may soon be delivered to your doorstep by the milkman, according to H. B. Hubbell of the dairy industry division of the University of California Agricultural Experiment Station.

Here's what you can look forward to:

1. Milk in any of several popular fruit flavors—raspberry, strawberry, cherry, and orange. And of course, there is always the old favorite, chocolate milk.

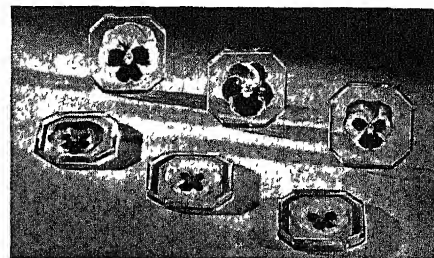
2. Half-and-half, a cereal cream that takes the place of the top milk that is disappearing with the rise in favor of the homogenized product.

3. A new bottled pancake mix, ready to pour on the skillet for breakfast hot cakes, containing fresh milk products. A similar waffle mix is also on the market. These are packaged in paper containers and may be ordered for delivery along with the morning milk, butter, and the various cottage cheeses.

4. Sour cream—also a popular dairy food. Its use is similar to that of mayonnaise. Seasoned, it makes an excellent dressing for fruit and vegetable salads.

5. Yogurt—while not new—is now packaged in half-pint containers. It is being widely used in reducing diets. Containing the milk-solids-not-fats, it has many uses indicated on the paper carton in which it comes.

Science News Letter, December 16, 1950



REAL PANSY COASTERS

These attractive coasters were made by embedding real pansies in Castolite, a new liquid casting plastic. With it students embed real flowers, butterflies, shells, photos, medals, etc. to make unusual jewelry, buttons, coasters, plaques, tiles, book ends, trays, other distinctive objects. Successfully used by hundreds of schools and colleges. Write for new FREE folder "Liquid Magic" showing things students can make. Many ideas for Christmas. The Castolite Company, Dept. TP-50, Woodstock, Ill.

• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N ST., Washington 6, D C and ask for Gadget Bulletin 549. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

⚙️ **DECORATION KIT** for glass, china and metal objects, contains six basic paint colors, two bottles of a thinner liquid, a paint brush and eight plain tumblers. Designs painted can be made permanent by baking in the oven

Science News Letter, December 16, 1950

⚙️ **CARBURETOR PREHEATER**, for quick-starting of automobile engines in cold weather, is a unit installed between carburetor and intake manifold. The unit contains a wire heated electrically from the battery. When gasoline hits the hot element it is instantly vaporized

Science News Letter, December 16, 1950

⚙️ **CHILI FLAVOR** for frankfurters, added in the manufacturing process, is a seasoning containing a number of spices in addition to those used in making former chili powder. "Hot dogs" containing it can be served without the customary outside sauces to give better taste.

Science News Letter, December 16, 1950

⚙️ **VACUUM CLEANER**, for use in laundering rugs and upholstery at home, has an over-size motor that supplies high suction to pick up suds and water as well as dirt and lint. Its rubber-sealed metal reservoir is easily detached for convenient emptying.

Science News Letter, December 16, 1950

Do You Know?

Larvae of all mosquitoes develop in water.

Frozen fish keeps well if kept completely frozen.

Roughly, there are 1,000 kinds of trees in America.

A promising cure for rattlesnake bites, still in experimental state, is a serum from king snakes.

Canned watermelon juice is promised for the near future.

A male hippopotamus at the Philadelphia zoo, a youngster in 1936, now weighs about three tons.

Titanium was discovered by an English clergyman in 1791 and named by a German scientist some years later.

The soil in pots of houseplants will be sufficiently aerated if watered thoroughly and then permitted to dry out.



⚙️ **CHRISTMAS KIT** for the youngster includes plastic blocks of various shapes, as shown in the picture, which can be fitted together to form many objects from a giraffe to a rocket gun. Rustproof fast-

eners are used to snap pieces together.

Science News Letter, December 16, 1950

⚙️ **ADJUSTABLE DESK TRAY**, holding either letter or legal size papers, is made of light-weight long-wearing plastic in two parts connected by a metal center panel. The plastic parts can be slipped in and out of the metal panel, and are held in the desired position by metal tabs.

Science News Letter, December 16, 1950

⚙️ **HAND BRUSH**, for clothing or upholstery, is made of wool fibers firmly bonded with rubber-like neoprene, and will pick up lint, face powder and other clinging substances usually hard to remove. It can be used also with cleaning fluids because of its neoprene bond

Science News Letter, December 16, 1950

⚙️ **SELF-LOCKING STAPLE** to hold wire fencing to a wooden post, recently patented, resembles the ordinary U-shaped staple but has outward projecting barbs near the pointed ends. These bite into the wood when an attempt is made to pull the staple out of the post

Science News Letter, December 16, 1950

CHEMISTRY for Christmas

- THE MAGAZINE GIFT for your friends who have a keen curiosity about the why and how of the chemical world.
- THE MAGAZINE GIFT that helps make chemistry understandable.
- THE MAGAZINE GIFT that comes nine times a year (one issue a big special one) for \$2.50.
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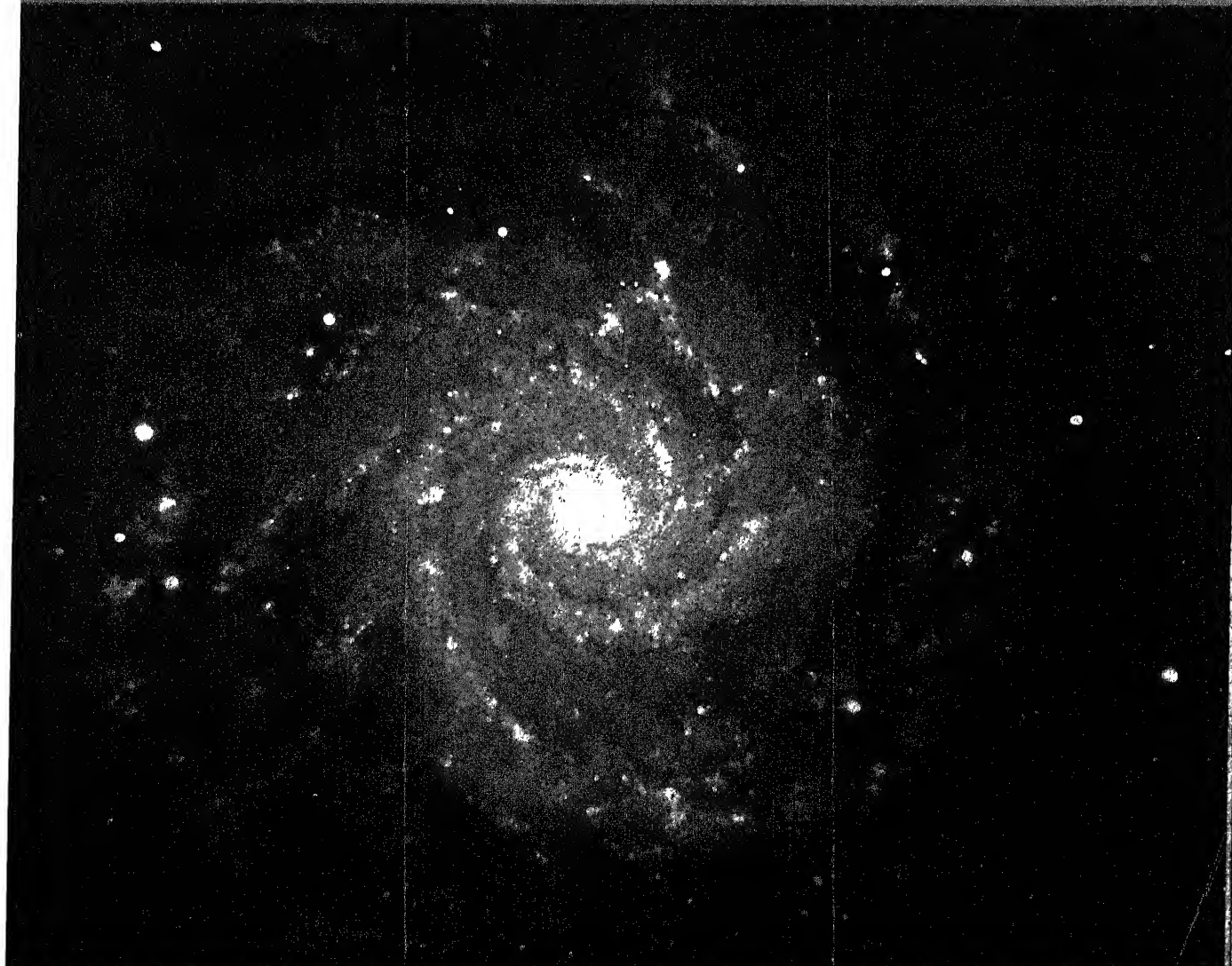
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SCIENCE NEWS LETTER

In This Issue—SCIENCE REVIEW OF THE YEAR



THE WEEKLY SUMMARY OF CURRENT SCIENCE



Celestial Fireworks

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50 A YEAR

Intergalactic Astronomical Research Institute

VOL. 58 NO. 26 PAGES 401-416

MEDICINE

Cause of Roseola Found

"Baby measles," formerly thought by some to be not a disease at all but allergic reaction, is transmitted by virus and probably carried by adult.

➤ SCIENTISTS finally have determined the cause of roseola, or "baby measles," a common disease of infants which scares the daylighters out of parents but is actually not very serious.

Physicians at the University of California School of Medicine have evidence that the disease is caused by a virus, and for the first time they have achieved its transmission in animal experimentation.

Until now a large segment of the medical profession, particularly in Europe, has maintained that roseola was not really a disease. It was maintained that the rash accompanying the disease, which is also known as exanthema subitum (surprise rash), was an allergic reaction.

What frightens parents is the three-day fever, with a temperature commonly as high as 105 degrees. When the temperature drops and the disease seems about over, out pops the rash, resembling measles, which lasts just one day usually. After the one-day rash the disease is terminated. The disease occurs in nearly all children sometime between the ages of six months and two years.

What have fascinated scientists, aside from the infectious agent responsible, are mysterious circumstances which have created doubt that roseola is actually a disease.

Chief among these is how children acquire the disease. It occurs frequently among children who are most carefully guarded against exposure to sick children or adults. Moreover, there is serious question about the possibility of transmitting it from an infant with the disease to a healthy infant.

The California scientists conclude that the most likely source of the infection is the healthy adult. They speculate that the virus is something like herpes simplex, a common infection which causes fever blisters. Like herpes, roseola virus may be present at all times in the oral passages of the adult, even though it may not cause disease in the carrier. They are now trying to isolate the virus from throat washings of adults.

In determining the nature of the disease agent, the scientists took blood serum from a diseased infant. Then they passed this through a filter which catches all infectious agents larger than viruses. When the filtered residue was injected into monkeys it reproduced the disease over and over again.

The research was reported in *PEDIATRICS* (Oct.) by Drs. C. Henry Kempe, Edward B. Shaw, Henry K. Silver, and J. R. Jackson, all of the department of pediatrics.

Science News Letter, December 23, 1950

PUBLIC HEALTH

Weapon Against Typhus

New rat killer, warfarin, is successful where 1080 and ANTU have both failed. Can be used in minute proportions. Rats do not become bait-shy.

➤ A POWERFUL weapon against plague and typhus fever has been found in a chemical called warfarin.

The chemical is a rat-killer, but it is "not just another rodenticide," Dr. Wayland J. Hayes, Jr., and Thomas B. Gaines of the U. S. Public Health Service declare after field and laboratory tests.

"Warfarin provides a completely new workable approach to rodent control," the public health scientists state.

Control of rats is important in the fight against typhus fever and plague, since both are spread by rats and rat fleas. Some of the tests in Savannah, Ga., were made in the very place that had been a focus of typhus fever infection and where the role of rat fleas in spreading the disease was discovered.

Both 1080 and ANTU, two warborn rat killers, had been used in these places with only partial success. Warfarin was successful in controlling rats in these places even when used in amounts as small as five-thousandths percent of the amount of yellow cornmeal used as bait.

Important advantage of warfarin is that rats and mice do not get bait-shy. The chemical is a slow-acting poison, but the rodents will go on eating it on bait until they die. They die without exciting the suspicion of other rodents, so that the poison continues to be effective for rat control.

Cats and maybe dogs might get poisoned from eating poisoned rats.

Although highly poisonous when taken in repeated doses, the scientists do not seem to think the hazard to humans from

warfarin bait would be great. Bait stations and bait cups were nevertheless used in their trials whenever there was any chance that a domestic animal or child or other irresponsible person might get at the bait. There seems no reason why people generally as well as pest control specialists should not learn to use warfarin successfully, the scientists state.

Warfarin, discovered by Dr. Karl Paul Link and associates of the University of Wisconsin, is related to dicumarol, anti-blood clotting chemical used to prevent blood clots in veins. It acts by checking formation in the blood of prothrombin, chemical important for normal clotting of blood, and by causing damage to small blood vessels. It causes internal hemorrhages in poisoned rats and the animals apparently die of shock. Warfarin gets its name from the initial letters of the Wisconsin Alumni Research Foundation which holds the patents. Details of the trials of it in Savannah are reported in *Public Health Reports*.

Science News Letter, December 23, 1950

PSYCHOLOGY

Emergency Proclamation Good for Morale

➤ LEADING psychologists and psychiatrists agree with high government officials in believing that the proclamation by President Truman of a national emergency will have good psychological effect on the people.

"However," Dr. Gordon W. Allport told Science Service, "the proclamation should be followed up. It is only the first step. Next the government should tell the people what they can do about the situation." Dr. Allport is professor of psychology at Harvard.

President-elect Leo H. Bartemeier of the American Psychiatric Association told Science Service that "the people know the situation is bad, but the proclamation should help to unite the people and to make them realize how tremendous the problem is."

"We know from experience in the last war," Dr. Allport declared, "that bad news increases morale."

American people know how to face up to reverses, he said, but they need to know specifically what they can do to overcome those reverses if their morale is to remain unshaken.

In Dr. Bartemeier's opinion, the American people are facing up to the international crisis very well indeed. They are much more realistic this time than they were during the last war, he declared. He sees an absence of hysteria now.

As to what the government can do to keep up this good morale, Dr. Bartemeier said he thinks the various departments are already doing a good job. He pointed particularly to the activities on behalf of Civil Defense by the several state governments.

Science News Letter, December 23, 1950

GENERAL SCIENCE

Need New Magnetic Theory

Carnegie Institution of Washington reports year's advances in this field and also in biology, heredity, obstetrics and other branches of science.

See Front Cover

➤ BEFORE scientists can solve the puzzle of the main magnetic field of the earth and account for it, it may be necessary to revise the basic theories regarding magnetism itself, Dr. Vannevar Bush, president of the Carnegie Institution of Washington, hints in his annual report.

In the stars, Dr. Bush explained, magnetic fields have been found by the Carnegie Institution astronomer, Dr. Horace W. Babcock, which "perform evolutions which would be quite unbelievable if the evidence were not well supported."

In the study of the magnetism of rocks in the earth, Dr. Bush reported that evidence seems to have been found for a transient local reversal of the magnetic field, perhaps arising from localized electric current deep inside the earth.

These localized currents, deep in the earth, seem to be the cause of the variations of the way the compass points year by year.

Rocks were found several years ago by Carnegie scientists that were magnetized with the south-seeking pole pointing downward as though they were laid down in the southern hemisphere, although they were found in the Appalachians of eastern United States and were of Silurian age, about 210 million years old. It is now believed that there was no gigantic major shift of land mass. Instead electrical currents in the earth's depths overpowered and reversed the general magnetic field of the earth. Now reversals of the compass do not occur, but there are violent deviations of the compass in a pattern which slowly moves westward over the surface of the earth.

Inversion Point Not Constant

Dr. Bush reported as an important discovery of the year the fact that the point that the common mineral, quartz, changes from one crystalline form to another, called the inversion point, is not a constant of nature, as long supposed. Careful measurements on about 300 specimens show that the inversion temperature varies from sample to sample, a fact that is expected to have important implications in geology.

The speed of earthquake waves in the upper six to 12 miles of the earth's crust is higher than previously supposed, Dr. Bush reported, bringing the natural vibrations into line with the travel of waves from explosions.

Nearer to Plant's Secret

Plant biologists on the Carnegie staff are getting closer to the secrets of photosyn-

thesis, particularly the chemical part of the reaction by which light is converted into chemical energy. There is evidence that components in the mechanism other than chlorophyll are necessary, and these are formed more slowly in the plant than chlorophyll.

Fundamental studies upon the bearer of heredity, the chromosomes, show that some of the changes of mutations in the genetic inheritance of living things, in the case of the experiments on corn, are due to minute pieces of the chromosomes moving from one position to another. When such a piece gets next to a gene, controlling some characteristics, its normal action is inhibited.

Hale Telescope

The Hale telescope has been busy during its first year in operation, making a small but memorable beginning on its broad program designed to extend our knowledge

of the large-scale structures of the universe. One of the delightful by-products of this work with the 200-inch telescope is a series of exquisite photographs bringing out details of the heavens never before seen.

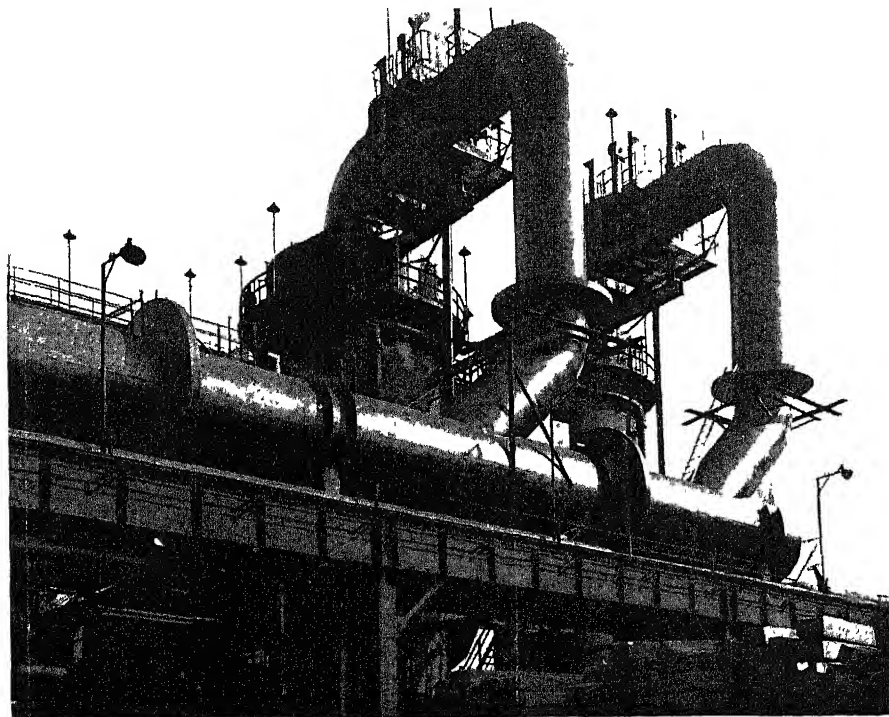
The spiral nebula NGC 628, shown on the cover of this week's SCIENCE NEWS LETTER, is in the constellation of Pisces, the fishes. One of the brighter and larger spirals, it is about five million light years away. Measurements of its velocity show it to be moving away from the earth at a speed of approximately 300 miles per second.

Sex Reversal Accomplished

Sex reversal has been accomplished for the first time in a mammal, through the work of Dr. R. H. Burns of the Carnegie Department of Embryology. It was produced in the opossum gonad by treatment of pouch young with the female sex hormone estrogens.

A practical instrument for use of obstetricians was produced as a by-product of a physiological research by Dr. S. R. M. Reynolds. Called the multichannel tokodynamometer, it records the contractions of all parts of the human uterus in childbirth. Normal patterns of contractions can be distinguished from abnormal types that do not permit smooth and properly timed passage of the infant.

Science News Letter, December 23, 1950



SMOKE WASHERS—Smoke stacks are made smokeless at the National Works of U. S. Steel's National Tube Company where gas from the blast furnaces goes through these gas washers in which dirt is removed by a multiple water spray. Then electrostatic precipitators further reduce the dust content of the gas.

MEDICINE

"Encouraging responses" were noted when 33 patients in late stages with extensive cancers were treated with 24,000,000-volt atom smasher.

➤ "ENCOURAGING responses" in the treatment of 33 cancer patients with a 24 million volt betatron were reported by Drs. Roger A. Harvey, Lewis L. Haas and John S. Laughlin of the University of Illinois College of Medicine at the meeting of the Radiological Society of North America in Chicago.

Because these patients were all in late stages of the disease with extensive cancers, the "ultimate salvage rate" is not expected to be very high. But from the experience with this group of patients, the doctors believe that wider application of the betatron is justified.

The extreme penetration and distribution of intensity of the X-ray beam from this machine require special attention in treatment planning, the doctors pointed out. They feel that better results could be had from conventional X-ray treatments by adopting some of the features of preparation of the patient for betatron treatments.

Because rather large amounts of normal tissue are unavoidably exposed to the X-ray beam when one so penetrating as the 24 million volt betatron X-ray beam is used, the doctors were particularly interested in possible secondary complications. So far, however, there has been a minimal amount of radiation sickness. Patients have not had any significant changes in their blood. Skin reactions were greater on the side where the beam exits from the body than on the entrance side, but have been "remarkably mild" and have not caused much discomfort to the patients.

The betatron, the doctors stated, is "not

a substitute for early diagnosis and prompt treatment of cancer."

Patients with severe and intractable heart disease may benefit from another kind of radiation treatment, namely large doses of radioactive iodine, it appears from good results reported by Drs. Richard H. Chamberlain, Charles C. Wolferth, Jack Edeiken and John J. Meade of the University of Pennsylvania.

Out of a group of 66 patients given this treatment, 39 have now been followed long enough for preliminary evaluation of the results, the Pennsylvania doctors stated. Best results were obtained by those with severe angina pectoris. Most of these showed marked improvement. Those with severe congestive heart failure did not get as much benefit, although 27% experienced good relief and another 27% fair relief. How long the good effect will last is not yet known.

Science News Letter, December 23, 1950

INVENTION

Oysters Shucked By Vacuum Method

➤ NO TOOLS or heat are required to open oyster shells in a process on which the government issued a patent recently. It might be called the vacuum way, and it works with clams and other bivalves.

The process utilizes a vacuum chamber into which a considerable quantity of oysters is placed at a time. When the cover is closed and sealed, the air inside is removed by a vacuum pump. In a relatively

short time all shells are opened up wide.

Then air is permitted to rush into the chamber. The sudden change in pressure kills the oysters by tearing the shell contracting muscles, thus enabling the meat to be removed easily.

The inventor is John W. Pogany, Port Townsend, Wash. Patent 2,530,783 was awarded to him.

Science News Letter, December 23, 1950

SCIENCE NEWS LETTER

VOL. 58 DECEMBER 23, 1950 No. 26

45,400 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W., Washington 6, D. C., North 2255. Edited by WATSON DAVIS

Subscription rates: 1 yr., \$5.50, 2 yrs., \$10.00, 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to periodical literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation Advertising Representatives: Howland and Howland, Inc., 363 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago State 2-4822.

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GENERAL SCIENCE

Science Review for 1950

Attempt to make H-bomb, calendar from exploding atoms, start of 30-day weather prediction among top science highlights of year.

This summary of the year's happenings in the world of science is limited by space to just the highlights. Most of the events are described in detail in the pages of SCIENCE NEWS LETTER for the current year. If you wish to refer to any particular report, you may find it readily through the index (See SNL, June 24 and also the issue which will appear next week, Dec 30).

By SCIENCE SERVICE STAFF

Upon a wide front, science and technology have made significant gains of practical and fundamental importance during 1950. Great telescopes have extracted new facts about the heavens. There is accelerated promise of bigger atomic bombs to come, while atomic science continues to give aid to health and human understanding. Cells and chemicals give new medical promise. Biologists have seized greater control over nature.

There is new progress despite the jar that impending world war gives to non-military research and the diversion of brains and talent to secret weapons and material.

Exploding carbon atoms created in millennia past by cosmic rays have given archaeologists a new atomic calendar with which ancient civilization can be dated.

A billion dollars or so was pledged by America in a secret attempt to make a super-atomic bomb, triggered by the older fission bomb and using the tritium hydrogen isotope as the "explosive."

Predicting officially the weather 30 days in advance for the United States became a regular procedure.

Color television arrived in a flurry of controversy, while better and more widespread transmission for television was forecast by a coated wire channel. And in the single side-band radio transmission there is the possibility of doubling the available radio channels.

In the air, America saw its first turbo-prop transport and omnirange beams were installed for guiding planes at airports.

In the heavens, it was discovered that Proxima Centauri, star nearest the solar system, shoots out terrific geysers of flaming gases to double its brightness in a few minutes. A great smash of a meteor hitting the earth was discovered as a crater in Quebec. In the Pacific a new major mountain range on the ocean bottom was discovered.

Industry now has a new ceramic that can be cut, threaded or turned on a lathe.

In medicine, as the many kinds of antibiotic "wonder drugs" continued to save

human life, any physician can now prescribe the anti-rheumatism drugs, cortisone and ACTH, and they are proving to be useful in a variety of other ills, including severe burns.

A new method of processing human blood allows the utilization of all the scores of its complex chemicals for medical use.

The manpower situation in science and technology became more critical with the nation on the verge of important decisions on how to allocate these human resources.

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AERONAUTICS

Develop Self-Start System For Jets and Gas Turbines

An aircraft self-starter system for jet and gas-turbine engines made possible starts without aid from ground power.

Light-weight pulsejet engines mounted at the outer tips of the rotating helicopter blades made possible greater pay-load capacity.

America's first turbo-prop transport, an airliner capable of speed approaching 500 miles an hour and with engine noise and vibration practically eliminated, was made ready for flight.

Many of the proposed 400 omnirange stations, which provide radio range signals in all directions instead of on a four-course range, were commissioned and put into use.

Supersonic speed propellers for subsonic planes were designed and promise higher speeds

for conventional airplanes.

Monochlorobromethane, called C-B for short, was recommended as an automatic fire extinguisher gas for airplanes, promising to save many lives.

A Fairchild military plane equipped with detachable box-car-size cargo compartment, with many possible uses, made its maiden flight.

An aircraft direction finder was developed which is attached to the airport radar and activated by VHF signals from a plane in communication, producing a line of light on the radar screen from the pip to the center.

Some 4,380 miles of airways were completely equipped with omniranges which give signals in all directions.

The glide slope signal of the Instrument Landing System was further developed eliminating effect upon it of changing ground levels due to snow, and making its signals uniform regardless of variations in nearby terrain.

Measurement of moisture under runway pavement was made less complicated and expensive through use of radioactive material.

A "quick disconnect" valve for fuel lines was developed to lessen the hazard of fire after crashes.

A new fire-resistant synthetic liquid suitable for use in the hydraulic system of a modern plane was developed and met approval by CAA.

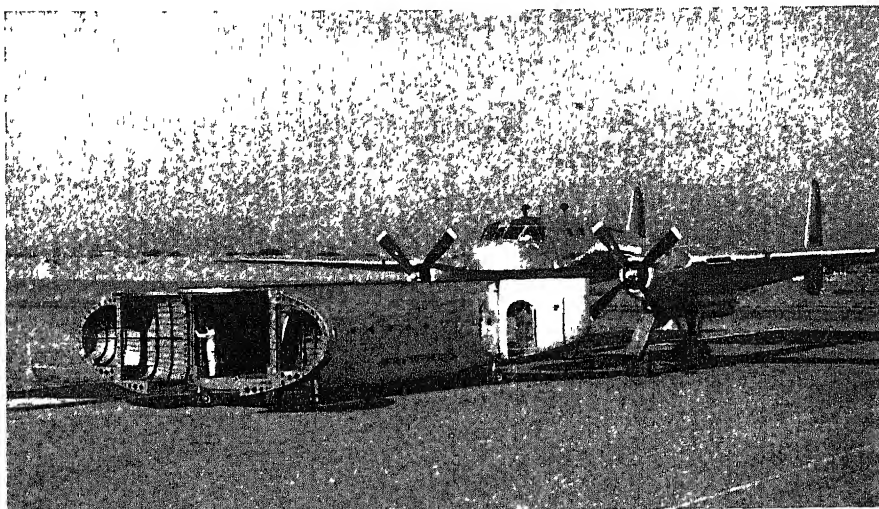
Eight-bladed giant propellers over 19 feet in diameter were developed for use with gas turbine engines.

Rivet-less wing panels for airplanes were constructed by a new forging process that saves cost, time and metal.

Aerodynamic forces at transonic speeds were studied by use of instrument-carrying bomb-like models dropped from altitudes of 35,000 to 40,000 feet and the fall tracked with optical and radar tracking units, slowed with braking devices before hitting the earth.

A device for feathering the propellers of an airplane automatically two seconds after engine failure was developed.

A camera which can take a "picture" of the extremely high pitched part of the noise of a jet plane was described; it makes use of film sensitive to ultra-sound waves.



DETACHABLE—The cargo-carrying fuselage of the Fairchild XC-120 Packplane can be towed from beneath the plane on its own wheels. These wheels are stowed within the "pod" when in flight.

A new type aircraft engine utilizing exhaust gases from a conventional piston power plant to operate a turbine was developed.

Quick take-off was made possible for a light bomber by wings the leading edge of which can be raised or lowered to change attack angle.

The Collier Trophy was awarded to the Radio Technical Commission for Aeronautics for developing the omnirange, VHF system of air navigation and traffic control officially adopted for U. S. use.

Experimental jet-propelled commercial air transports were in flight in Canada and England.

A three-wheel, low-down jeep which carries an electric generator solved the problem of quick starting of engines of jet-propelled airplanes on naval carriers.

A twin-jet fighting plane built in Canada was reported to be the world's most powerful fighter.

A new airplane gas turbine engine of the turbo-prop type was developed which is capable of producing two horsepower per pound of weight.

Aerodynamics problems at hypersonic speeds, five times faster than sound, were studied by firing model from gun into face of supersonic stream of air.

ARCHAEOLOGY

Archaeological Remains Dated by Carbon 14

A method of dating archaeological remains, if they are of organic origin, by measuring the proportion of radioactive carbon 14 remaining was first put to use, it is based on the fact that all organic material less than 25,000 years old contains radioactive carbon and that the radioactivity is lost at a constant rate.

The giant sloth lived in Gypsum Cave, Las Vegas, Nev., about 10,500 years ago, dating of his dung by the radiocarbon calendar showed; presumably man there was contemporaneous since his remains were found in alternate layers with those of the sloth.

The famous paintings by early man in Lascaux cave in the Dordogne, France, were found by the radiocarbon calendar to be about 15,000 years old.

Woven rope sandals from a lava-covered Oregon cave were found by the radiocarbon atomic calendar to be among the oldest articles associated with man in the Americas—9,000 years old.

The world's oldest known village site in Iraq was shown by the radioactive carbon calendar to be about 7,000 years old.

On Jebel Baradost, northeast Iraq, 7,000-year-old pottery was excavated from two caves.

Indians were shown by radioactive carbon dates to have lived in North America long before the present Eskimos; Pre-Indians lived in New York State at least 5,000 years ago.

Various evidences of the Colonial period, including a footprint, a gun-flint, fragments of a clay pipe, a rusty nail, a fragment of glass and two pieces of orange pottery, found in the brown earth beneath the "Viking Tower" of Newport, R. I., showed that it was not built until the 17th Century Colonial period.

Tiny, delicately-worked flakes of stone about the size of a paper clip and known to scientists as "Lamellar" flakes were found in the frozen soil of the Canadian Arctic and link the ancient Dorset people, who were probably the first Eskimos to reach the New World, to men who lived in Asia in Middle Stone Age or New Stone Age days.

More than 1,500 tiny, delicate flint objects

were collected on Cape Denbigh, on the most northwesterly extension of the Bering Sea, work of a Stone-Age people who lived there thousands of years ago.

A group of Alaskan people, comprising 3,000 individuals at the beginning of the century, have now been reduced by epidemics to only 40 persons, it was found.

An Indian campsite shown by radioactive carbon to be about 7,000 years old was discovered at the site of the Angostura reservoir, South Dakota.

An alphabet for writing Quechua, ancient language of the Incas still in common use, was devised and agreed upon by experts in the field.

A new painting was discovered among those made by Cro-Magnon Man in the cave at Lascaux, France, it represents a witch-doctor guarding the entrance to a subterranean chamber.

Flint implements of Old Stone Age types, possibly 30,000 years old, were collected on the surface of the desert in northwestern Saudi Arabia.

The first evidence of Stone Age Man was found near Khurramabad in Luristan, Persia. A Roman fortress was located near the Wadi Sirhan, northwest Saudi Arabia.

Anthropometric data were obtained for the first time on a series of 150 Bakhtiari tribesmen in southwest Persia.

The first temple from the Akkadian period (2350-2200 B. C.) was discovered in the ancient city of Nippur in Iraq as the earliest of a series of temples built in the course of 1600 years for a paramount god, Enlil.

Record of a murder trial in 1850 B. C., written in cuneiform script on a clay tablet, was unearthed in Iraq on the site of the ancient city of Nippur.

An important mathematical tablet about 4,000 years old was found at Tell Harmal near Baghdad, Iraq.

Discovery of a collection of 48 religious texts on papyrus, written in Coptic, containing apparently the whole body of literature of the Gnostic sect, previously believed completely lost, was announced.

Microfilming was undertaken of more than 500,000 pages of ancient manuscripts in St. Catherine's Monastery at Mt. Sinai, among them discovery was made of what may be the oldest copy of the New Testament in Greek and Syriac on gazelle's hide.

The fragment believed to be bone—only such specimen discovered in the Sutton Hoo ship burial—was found not to be bone at all but a cast of what was originally burned bone, the cast formed by contact of the burned bone with corroding iron under acid soil conditions.

ASTRONOMY

Discover Two More Stars With Giant, Sun-Like Flares

Discovery of flare-ups on two red dwarf stars raised to five the number of stars known to have flares similar to those on the sun, but of such violence as to more than double the star's total brightness within a few minutes; 50 flare-ups within the last quarter century were spotted on Proxima Centauri, star nearest the earth.

Pluto, through observation with the 200-inch telescope, was found to be second smallest planet and only 3,550 miles across.

Chubb meteor crater, larger than any previously known, more than two miles across,

was discovered in Quebec, Canada, Australia's half-mile-wide Wolf Creek Crater was dug out by a meteor, analysis of rock fragments showed.

Photographs were successfully made with a two-mirror, Schmidt-type astronomical telescope, first of its type to go into operation.

Number of radio stars known to broadcast the static picked up here on earth with microwave instruments was increased to 50.

Colors and luminosity of near-by stars were determined with highest accuracy, making possible a quick electronic method for determining the distance of certain stars from the earth by studying their apparent brightness and color.

Correction of the distance from the earth to the sun, and of the earth's path through space as well as more accurate calculation of the mass of the planets Mars, Venus, Mercury and earth-moon was made possible through use of a new, more accurate path for the asteroid Eros.

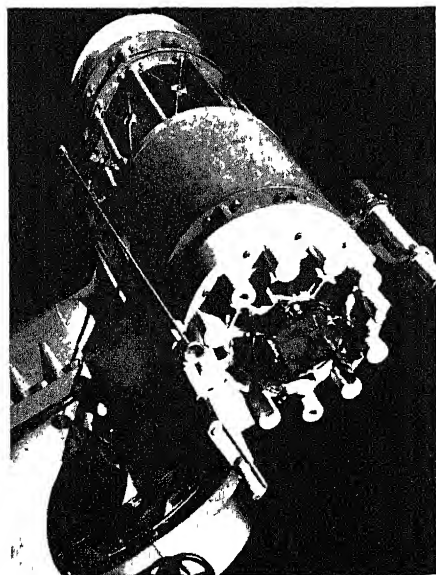
Newly discovered asteroid Icarus on its closest approach to the earth was found to be only one-third as far away as Eros when it comes nearest our planet and thus promised to replace Eros as a yardstick for solar distances.

One new comet, Minkowski, was discovered.

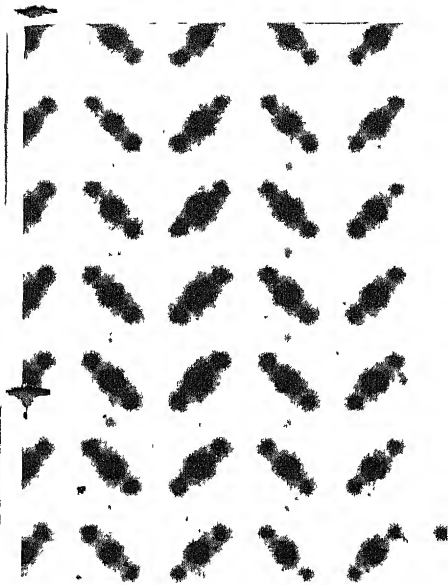
Novae seen to blaze up include one star in the constellation of Lacerta, three in Scorpio, and a fourth outburst of a nova-like star in Aquilae (all these in our own galaxy) plus one in the spiral nebula Messier 83, one in Messier 81 and one in IC 4051.

Two new color filters, one containing artificially grown ammonium dihydrogen phosphate crystals and the other using calcite for the thickest element, were put to use studying the flares, prominences and spots on the sun.

A huge sunspot was associated with serious disruption of international radio communica-



DOUBLE EYE—Not only was this two-mirror, Schmidt-type telescope, first of its kind, completed in the workshop of the University Observatory in St. Andrews during 1950, but successful photographs were taken with it at the Mills Observatory, Dundee, Scotland.



AN ATOM—Each of these dots is an atom, photographed for the first time with a new kind of microscope using both X-rays and ordinary light. The microscope was invented by Dr. Martin J. Buerger, MIT physicist. Photograph shows the structure of pyrite. Iron atoms with 26 electrons each are the darker spots, the fainter ones are sulfur atoms with 16 electrons each. Magnification is about 2,200,000 diameters.

tion Feb. 20 to 24; a severe radio disturbance was experienced Aug. 19 to 20; the radio storm that began July 11 was repeated five times at 27-day intervals and lasted about a week each time, such recurring storms being usual during declining solar activity.

Confirmation through experiment here on earth was obtained of the first step in the atomic transmutations that keep the sun stoked with energy through interaction of carbon, nitrogen and hydrogen.

An artificial star made of a tungsten filament lamp housed in a box, and carried from one mountain peak to another was developed and used as a standard to aid in measuring the distance of real stars.

A tenth planet, far beyond the last discovered planet Pluto and 77 times as far from the sun as is the earth, was predicted on the basis of study of the orbits of comets.

Changes in the period of revolution of 18 double-star-teams was explained as due to the ejection of matter from one of the pair.

A second double star system in which one star has a huge atmosphere that "eclipses" the other star was discovered.

Two great clouds of extra-galactic nebulae were discovered, providing new information about the distribution of "island universes" in space.

Fifteen hundred new galaxies of stars similar

to our Milky Way were discovered in a survey of the bowl of the Big Dipper.

A 23-year survey of stars of the ninth magnitude or brighter found within 30 degrees each side of the celestial equator was completed and their proper motions compared with those recorded over half a century ago.

BIOLOGICAL SCIENCES

Find Bacteria Multiply by Dividing, as Human Cells Do

First clear-cut evidence was found that bacteria multiply by the same complex process of dividing, called mitosis, that human cells go through.

Protoplasm was seen in three dimensions for the first time through a new technique for drying specimens without flattening them; the technique involves replacing the water of the specimen with carbon dioxide under high pressure which then evaporates, leaving the specimen uncollapsed.

A substance in plants called phycoerythrin was found to be the key to why plants blossom in accordance with the length of daylight and darkness.

Plants were grown with built-in protection against insects. New insecticides travel from the soil into the plant system.

Use of antibiotics instead of high temperatures for the preservation of canned foods was studied.

A four-fold increase in the output of penicillin resulted from a change made in the heredity of the mold.

The cells in the body of some animals do not stop dividing until a couple of hours after the death of the animal, experiments on mice showed.

Radioactive tracers from Oak Ridge enabled scientists to follow, step by step, the growth of a chicken from the egg.

Definite proof was obtained, through experiments on plant seeds, that radiation from an atomic bomb explosion can alter heredity, other experiments demonstrated that radiation damage to the chromosomes can be diminished by absence of oxygen.

The ovary of an old cocker spaniel, transplanted to a young mongrel, enabled the latter to give birth to thoroughbred cocker spaniel puppies.

A new kind of Siamese cat, pale yellow in color with deep orange ears, feet and tail and clear blue eyes, and with very affectionate and gentle disposition, was created by genetics.

New hybrid seed that will do for the sugar beet farmer what hybrid corn did for the corn farmer were developed.

A new hybrid sugar cane especially adapted to mechanical harvesting was developed.

Tomatoes were grown and ripened from a flower detached from the plant and planted in a glass flask containing synthetic food.

By prompt action when blight was discovered in an experimental plot of Victoria oats, a disease resistant variety was bred in time to save the nation's oat crop.

The breeding of opossums in captivity was reported.

A rich new field of pink shrimp was found off the west coast of Florida.

A new vaccine against rabies, immunizing dogs for 18 months, was reported.

Seventy-nine previously unknown types of fish found at Bikini Atoll, site of atom bomb tests, were reported.

Lobsters have a "homing instinct"; they can return to their original feeding grounds when

released elsewhere, it was learned in Bermuda.

Turtles and mice exposed to low concentrations of carbon monoxide were shown to be able to oxidize CO to carbon dioxide.

A single Guadalupe fur seal was discovered on an island off Southern California; in Florida, two ivory-billed woodpeckers were found. Both species had been considered extinct. The trumpeter swan appeared to be gaining in numbers. The whooping crane did not.

Forest fires in California were worse than they have been in a quarter of a century.

A large pall of smoke, originating from forest fires in the Canadian Northwest, covered eastern Canada, eastern United States, and northwestern Europe, Sept. 24-30, causing the sun and moon to take on a blue or purple color.

Cotton insects and grasshoppers took the biggest bite of a heavy insect toll which would have been even heavier, except for a cold, late spring over most of the country.

Tracing with Geiger counters the path of a soil-dwelling wireworm tagged with radioactive cobalt promised the development of better insect control; radioactive material attached to bird bands was used to clock the birds' return to the nest.

Two new insect killers—dieldrin, a fly-killer, and aldrin, useful against the boll weevil—went into commercial production.

Antimycin A, relative of streptomycin, was found to be promising as an insecticide.

Two new chemicals effective against mites were announced.

A strain of Scolytus bark beetle, carrier of Dutch elm disease, was found to be DDT-resistant.

Hearings were held to determine what controls are necessary on use of chemicals in fruit and vegetable growing to combat insects, weeds and plant diseases.

A new rat poison which acts by causing internal hemorrhages was introduced and experts predicted that with it and other new raticides the nation's annual loss to rodents could be cut by at least 75%.

Using a synthetic plant hormone, 2,4,5-T, apples were matured as much as 30 days earlier than usual.

The weed-killer 2,4-D sprayed from airplanes was found effective in eradicating sagebrush from southwest pasture land.

A new weed killer, maleic hydrazide, was found to kill pest plants in a cotton field without adverse effect on the cotton.

Another chemical, sodium 2,4-dichlorophenoxy ethyl sulfate, killed weeds in a strawberry bed without harming the strawberries.

Spraying fruit trees with a salt of maleic hydrazide in a weak solution delayed their blossoming, preventing frost damage.

Irradiation for a few seconds with very high frequency radio waves speeded up the germination of garden seeds.

Johnson grass, a Southern weed, was reported to be developing resistance to weedkillers.

Oak wilt, a serious forest disease that cannot yet be controlled, spread from the lake states south into Missouri and Arkansas, and east into Pennsylvania.

For the first time, all 48 states took part in the U. S. Plant Disease Warning Service.

After a three-year, \$120,000,000 fight against foot-and-mouth disease in Mexico, American scientists reported there was not a single new case of the plague in 1950.

Artificial cultivation of the virus of foot-and-mouth disease on slices of tissue from tongues of dead cattle was reported, a fast and accurate new test for the virus was developed.

Newcastle disease of poultry was combatted by a new and simple blood test for diagnosis, and by a method of exposing young chickens to air saturated with a weak strain of the virus to immunize them.

Use of radioactive tracers showed that plants absorb food from the soil very rapidly.

Sulfanilamide, found to stop sweet palm juices from fermenting, made it possible to tap palm trees as a source of sugar.

A method for killing typhoid, dysentery and other germs on fresh fruits and vegetables by pasteurization was developed.

Selective breeding to produce plumper cattle resulted in cows with slowed-down thyroid glands, unable to reproduce.

The reality of ice-worms was established when they were observed in the Seward ice field on the Yukon-Alaska boundary.

Ion-exchange treatment with artificial resins produced a milk which makes smoother ice cream.

Concentrated apple juice and grape juice were made possible by new methods of preserving volatile flavor essences.

A new drug, 2-amino-5-nitrothiazole, provided an economical method to prevent black-head disease in turkeys and chickens.

A plant cell is equipped with a network of strands that carry materials between the nucleus and the surrounding cytoplasm, microscopic study revealed.

Simulated undersea pressures developed in a special stainless steel "bomb" were found to kill bacteria and other microorganisms; at pressures of 200 to 300 atmospheres, bacteria died in a day or two.

Feeding tiny amounts of cobalt in carefully controlled diets speeded up the fattening of hogs.

New, more accurate, analytical techniques showed that plants need from two to 100 times as much sulfur as was formerly believed; soils, particularly in rural areas, show an acute shortage of sulfur.

The bark of the balsam poplar yielded a fungicidal extract.

Production of high grade cellulose from cane sugar by bacterial action was reported.

CHEMISTRY-PHYSICS

Giant Atom Smashers To Probe Nature's Secrets

Several new atom smashers were completed or under construction during the year: among them a new type non-ferromagnetic synchrotron employing coils instead of iron-core electromagnet; an electron linear accelerator which in the prototype stage produced 25,000,000 electron volts; a 7,000,000,000 electron volt bevatron; and the world's largest betatron with capacity of 300,000,000 electron volts.

The first non-AEC owned nuclear reactor was approved for research at the Consolidated University of North Carolina.

Dimensions of three types of nuclear reactors were made public by the Atomic Energy Commission.

An X-ray microscope using curved mirror for image enlargement enabled scientists to see internal details of living and non-living matter at magnifications of 100 diameters.

A low-cost table model electron microscope was developed which is capable of magnifications by photography to 50,000 diameters.

Definite evidence was discovered for the existence of a double-weight or duplex neutron called the "dineutron," formed by the bom-

bardment of a triton, heart of hydrogen isotope three, tritium, by another triton, the dineutron lives only a very short time and then becomes two ordinary neutrons.

The neutron is not a fundamental particle of nature, it was discovered, it decays after ten to 30 minutes of freedom into an electron and proton.

Lifetime of one of the fundamental particles within the atom, the pionson, was determined to be one 60-millionth of a second.

Through forked paths showing on photographs of cosmic rays, two new kinds of mesons were discovered, having extraordinarily short lives, only two ten-billionths of a second.

Cast blocks of emulsion without any glass photographic plates were found useful in photographing the tracks of cosmic rays.

First photographs of cosmic ray collisions 100 miles above the earth were obtained with a V-2 rocket.

The summit of the Swiss Jungfrau mountain was chosen as the site of a cosmic ray observatory for the study of the production of mesons.

Two new elements, heaviest yet known, No. 97 and No. 98, were created in the cyclotron, they were named berkelium and californium.

Americium, element 95, was isolated in silvery metallic form and found to be lighter than expected, only about half the density of its parent plutonium.

Three new light-weight isotopes of neptunium were made by bombarding uranium atoms with deuterium hearts, the new isotopes have atomic weights of 231, 232 and 233.

Tellurium 130, previously believed stable, was found to be radioactive with the extraordinarily long half life of 15 sextillion years.

Tritium (triple weight hydrogen) was found in minute amounts in the moisture of the air.

With a new microscope using light in two wavelengths physicists looked at individual atoms for the first time.

Announcement was made by President Truman that research would be pushed on the development of a hydrogen super-bomb.

Heat transfer through helium at temperatures near absolute zero was found to be practically instantaneous, settling an international dispute.

Evidence was discovered that uranium is a superconductor at temperatures near absolute zero, the exact temperature depending on the amount of impurity present.

Magnesium was found, like gold, to have increased electrical resistance at temperatures close to absolute zero.

The gray metal form of tin was added to germanium and silicon as a material that will act as semiconductor.

Prospecting for thorium and uranium by airplane was made possible by a new atmosphere monitor that can measure the radon gas emitted by deposits of these radioactive materials.

New kinds of nuclear radiation detectors, utilizing crystals of potassium bromide which become conductors of electricity when exposed to gamma or X-rays, and sodium iodide activated by a tiny amount of radioactive iodine salt, were announced.

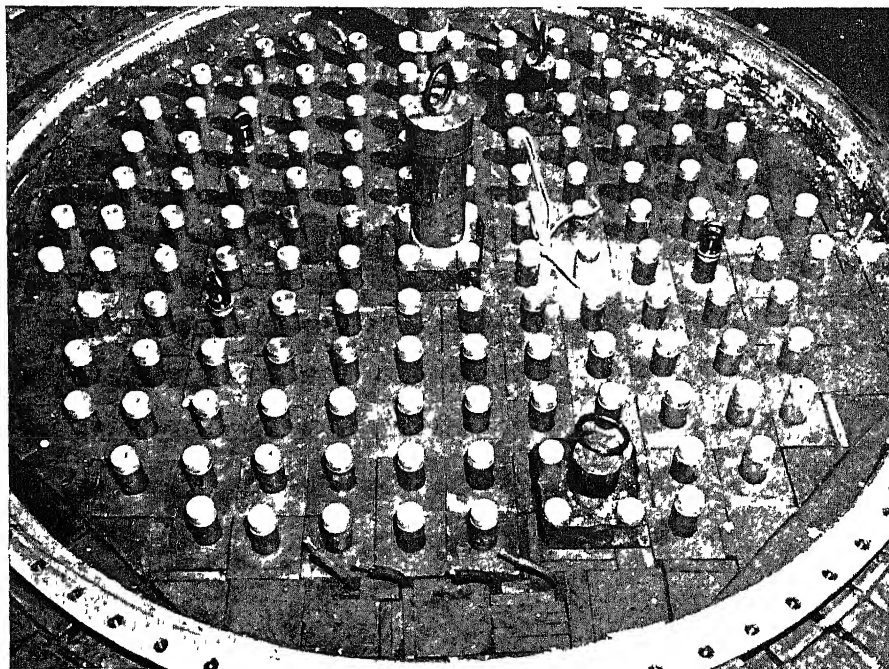
A neutron counter consisting of a detector tube lined with boron was announced.

A universal scintillation counter was developed to count all three kinds of radiation—alpha, beta and gamma.

A tiny, efficient radiation indicator, the dosimeter, was developed to indicate the presence of X-rays or gamma radiation when the chloroform and purple dye it contains changes color to yellow.

Construction was started on a plant to "breed" fissionable plutonium from non-fissionable uranium.

An invisible dust of sand coated with radioactive poisons collected from the waste of



REACTOR CORE—Top of the reactor core of the Argonne National Laboratory's heavy water reactor. The shield has been removed to show the ends of uranium rods which are suspended in a tank of heavy water. Materials to be made radioactive are lowered into the hole in the center.



PROTECTION—The special visor on this crash helmet insures that the helmet will stay on a flier's head even during high speed bailouts, protecting him from concussion. When not in use, it can be pushed up out of the way.

atomic furnaces was cited as a possible mystery weapon, which could wipe out the population of large cities.

A process was developed for grinding tough materials by using liquid nitrogen to cool them to a point of maximum fragility.

The world's first neutron-absorbing glass, giving transparent protection for eyes against atomic damage, was made from cadmium borosilicates with fluorides, while glasses containing tungsten phosphate were made for protection against X-rays.

The action of catalysts was explained as due to electrical fields inside the atoms, which pull and distort the shape of atoms near the surface and so make them act in an unusual way.

A joint report released by the Atomic Energy Commission and Department of Defense was the most complete technical description made public on what happens when the atomic energy is released as a weapon.

A camera was designed to take pictures of shock and detonation waves in explosions, it can produce 100,000,000 frames a second.

A chemical wedding between the element boron and organic substances promised industry a new family of compounds that may rival the new silicone plastics, lubricants and waterproofing substances.

The first metallic element that shrinks instead of expanding when heated was made available as a by-product of the atomic bomb—radioactive polonium.

Crystals of mica, bigger and better than natural crystals, were created synthetically.

The amount of energy necessary to remove an atom from the germanium lattice was determined by electron bombardment.

The P-N boundary in germanium was shown to function as a crystal counter.

Two German chemists, Drs Otto Diels and Kurt Alder, won the 1950 Nobel Prize in chemistry for their discovery of the widely used synthesis method bearing their name.

Nobel Prize in physics this year was won by Dr. Cecil F. Powell of Bristol University for his research on mesons and his development of methods to photograph these subatomic particles.

EARTH SCIENCES

Long Range Predictions Issued Twice Monthly

Beginning in February, the U S Weather Bureau issued for newspaper use twice monthly 30-day predictions, in the first three months these were 79% correct.

Large-scale practical application of theory of rainmaking was made in New York in an effort to relieve water shortage there. Results are still being studied. Disagreement about rainmaking, based on uncertainty over number and efficiency of natural nuclei in atmosphere, continued.

A mechanism for the generation of thunderstorm electricity involving collision of ice crystals formed by sublimation colliding with super-cooled water droplets was proposed.

Specially designed radar sets with ranges of 200 to 250 miles, working in pairs, aided in tracking storms and hurricanes.

New types of atmospheric nuclei originating rain drops were identified with the electron microscope; these included minute crystals of sea salt, magnesium chloride particles and silica dusts so fine they cannot be seen with ordinary microscopes.

Mauna Loa erupted, spreading a haze over 3,500,000 square miles of the Pacific Ocean.

A squall line was interpreted as a "pressure jump line" (small but sharp barometric pressure rise occurring along a line) propagated as a gravitational wave along the temperature inversion in a stratified atmosphere. The zone of interaction of two intersecting pressure jump lines was suggested as a preferred zone for tornado formation.

Thorium occurs in the monazite sands of the Gaya district and other parts of India, it was reported.

Large quantities of jet engine fuel can be extracted from the oil shales of Colorado, it was announced.

Major deposits of phosphates, possible source of uranium, were found on the floor of the Gulf of Mexico off the Florida coast.

Deposits were found of rare earth elements suitable for use in tracer bullets and cigarette lighters.

There were 150 earthquakes of sufficient strength to record themselves on seismographs so that they could be immediately located, these included an extremely destructive one in Cuzco, Peru, another in Colombia, one in China, and one of the greatest earthquakes in history in Assam.

A laboratory completed at the University of California at Los Angeles is equipped with machines capable of exerting pressures equivalent to those 22 miles below the earth's surface for studying earthquake causes.

The Pacific Coast, 50,000,000 years ago, was tropical as far north as Puget Sound, study of marine fossils indicated.

The most disastrous flood in Canada's history caused great damage at Winnipeg.

Evidence that a glacier, larger than any other

known, descended both east and west slopes of the Sierra Nevada mountains about a million years ago was discovered.

A new mountain range was discovered, the top of which is 2,700 feet below the surface of the Pacific ocean.

A possible clue to the evolutionary "missing link" was found in an apeman's thumb bone showing that the thumb, while shorter than man's, was useful for claspings.

Jawbones of triconodonts were found in Early Cretaceous sands of northern Texas, the earliest of such mammal remains ever discovered there.

ENGINEERING-TECHNOLOGY

Single Wire Promising To Supplement Coaxial Cable

A single wire with a special insulation and funnel-shaped terminals may supplement the coaxial cable as a low-cost telephone and television transmission line, it was announced.

America's first coal-burning gas turbine locomotive was constructed.

A new raw material for synthetic rubber, para alpha dimethyl styrene, was obtained from spruce paper manufacture waste.

A water-cooled periscope was used to examine the inner parts of the flaming gases in the exhaust of a jet engine.

A new type of photoelectric cell, called a phototransistor, was made with a tiny disk of germanium as a heart.

The first completely self-contained and completely mobile underwater motion picture camera was developed.

By covering ceiling, walls and floor of a room with heat-reflecting aluminum foil, it was found possible to keep the occupants of the room comfortable with only minor conventional heating or air-conditioning apparatus.

Direct sunlight supplied 75% of the heat needed to keep an occupied experimental solar-house in Massachusetts comfortable during the past winter.

A lightweight Diesel engine was developed and used in a racing automobile.

A metal electronic tube rectifier for converting AC from feed lines to DC for driving motors opened the way for widespread electrification of railroads.

New development of the magnetic-fluid clutch utilized two cylinders able to rotate independently on same axis with magnetic fluid between.

An electrical insulation tape made from glass fibers and silicone rubber, resilient at high temperatures, was developed for use in motors of electric locomotives.

Making engine parts radioactive by use of the atomic pile, made it possible to measure engine wear by measuring radioactive iron particles in the oil after a test run.

Gas turbine engines for highway freight hauling were experimentally tested.

New form of carbon, hard enough to scratch glass and with high thermal conductivity, was developed.

Tartaric acid, ingredient of baking powder, was made synthetically from benzol and hydrogen peroxide, replacing the natural product from French wine industry.

Silicone rubbers developed for high temperature uses were found suitable for use at temperatures as extremely low as 148 degrees below zero Fahrenheit.

A mobile carbon dioxide generator was de-

veloped to produce the fire-fighting gas in large quantities for military use

"BEMAC", new giant electronic computing machine, calculated every movement that a giant missile would make in flight and made a motion picture record of its imaginary flight, before the missile was fired.

An improved 400-digit memory tube was developed for use in electronic calculators

A new device, developed as an attachment for electronic computers, enabled them to detect errors and record them, correct them and proceed to the right answer.

A radio transmitter-receiver, tiny enough to hold in one hand and powered with a miniature battery, was developed and put into production for use by downed airplane pilots in lifeboats or lifebelts.

A machine was designed to record 14 two-way conversations on a single magnetic paper tape at the same time for use in airplane traffic control.

A device was developed for use on a radio receiver to stop its operation for a minute or so at the sound of a hand clap or a yell "shut up"

A method for transmitting a single sideband instead of the two which now blend into a single perfect signal in present receivers, neared perfection and promised to double the number of available radio channels.

A color filter using three films of vacuum-applied silver and magnesium fluoride, having applications in color photography and color television, was reported.

A small-size television pick-up tube, the "vidicon," was developed; it employs photoconduction, the property of a poor conductor of electricity in darkness of becoming a good conductor when exposed to light.

A cut in both cost and size of television receivers was made possible by use of prefabrication and printed circuits.

Mirrors that reflect one color only, the color depending on the thickness of a deposited metallic layer, were developed for use in color television.

Permission was given to the Columbia Broadcasting System to start color television broadcasting

A hot-spray process for applying paint, varnish and lacquer was perfected; the heat replaces a large part of the solvents, improving coverage and shortening drying time

A new method for processing color photographic film in only 20 minutes and making prints in 15 minutes was developed.

Addition of scrap iron and limonite to concrete gives better protection from atomic radiation, it was found.

A new ceramic that can be cut, threaded, shaped or turned on a lathe was produced.

A new alloy of copper and beryllium added to zinc was developed; it has the same strength and electrical characteristics as brass

Molds for cast metal machine parts were made from sand bonded with phenolic resin, eliminating the necessity for smoothing off rough surfaces caused by the sand grains.

A turbo-hearth process for making steel was announced which is capable of making open hearth quality steel in 12 minutes without the use of external fuel.

A new stainless steel of chromium, nickel and copper was developed, having excellent corrosion resistance, high strength and hardness, ease of fabrication and low-temperature hardenability.

A synthetic rubber, made from butadiene and styrene by a process employing a sodium cata-

lyst, is suitable for use in the body of automobile tires.

A method was developed for the quick hardening of sand and mud to make a surface suitable for military trucks and airplanes by use of three inexpensive chemicals.

A filter was made from treated paper-making fibers mixed with asbestos to remove fine radioactive particles from gaseous wastes from nuclear processes and to filter smoke stack gases to prevent smog

MEDICAL SCIENCES

Cortisone and ACTH Aid in Battle Against Diseases

Cortisone and ACTH, adrenal and pituitary gland hormones respectively, were reported effective or promising in the following conditions besides arthritis: rheumatic fever, lupus erythematosus, leukemias, lymphosarcomas, Hodgkin's disease, severe burns, periarteritis nodosa and cranial arteritis, eye inflammations, asthma, and, for ACTH, a means of predicting the patient's chances of surviving surgery

Cortisone and an anti-folic acid chemical used in relays were reported promising in control of leukemia

Cortisone was made available to physicians as well as hospitals through regular drug channels

An improved method of synthesizing cortisone, eliminating the need for rare osmium, was announced, with prediction of larger supplies resulting

The step-by-step processes by which cortisone and allied steroid chemicals are synthesized from their parent chemicals by the adrenal glands were discovered through perfusion studies, giving new insight into adrenal physiology and chemistry and suggesting an industrially important method of obtaining high yields of some steroids related to cortisone from cheap parent chemicals.

A new compound obtained from ACTH was reported to give as good results in arthritis treatment as ACTH and cortisone with the added advantage of being potentially synthesizable

Pregnenolone, cheap synthetic steroid chemical, was reported to have anti-arthritis effect when taken in large amounts due to its conversion by the adrenal glands in part to cortisone and allied steroids

Increased supplies of ACTH were predicted from a method devised for getting it from cattle pituitary glands and from a new method of extracting it from hog pituitaries

Atropine was announced as a remedy for the so-called nerve gases, war gases related to some of the newer insecticides.

Defective giant molecules, fatty in nature, were discovered in the blood of patients with the artery disease, atherosclerosis, and implicated as the cause of the condition with a low-cholesterol diet suggested for controlling the condition

Promacetin, new sulfone chemical related to promin, diasone and sulfetron, was announced as a promising remedy for leprosy.

New, potentially life-saving remedy for infant diarrhea was found in the element, potassium

A mobile blood processing unit which through new techniques can separate red cells, white cells, platelets and essential plasma fractions within six hours after blood is drawn was produced to speed effective utilization of blood.

The first artificial heart which pumps un-

treated blood from a real heart through a kidney or other organ and back to the real heart was devised

An operation creating a bladder and outlet from part of the large intestine was devised for patients after operation for cancer of the bladder or other bladder diseases

A cheap chemical used as a boiler scaler, the tetra sodium salt of ethylene diamine tetra acetic acid, was announced as a remedy for dissolving kidney and bladder stones

Fibrinogen and thrombin, clotting chemicals from the blood, were used to remove kidney stones without surgical operation

The youngest fertilized human egg yet observed, a morula aged 60 hours, was reported

Discovery of a new epidemic disease, Influenza C, was announced.

Snipping a small diamond-shaped piece from the tissue leading from the stomach to the small intestines was devised as a less radical operation for ulcer patients.

A stomach hormone, gastrin, produced by the antrum, or lower part of the stomach, was discovered and reported as possibly playing a part in causing ulcers.

A quaternary ammonium compound, Bantnine, was reported effective as a remedy for stomach ulcers and for a condition of excessive sweating.

The attack on schistosomiasis, world's number three health problem, moved forward with success in field trials of two anti-snail chemicals, sodium and copper pentachlorophenates.

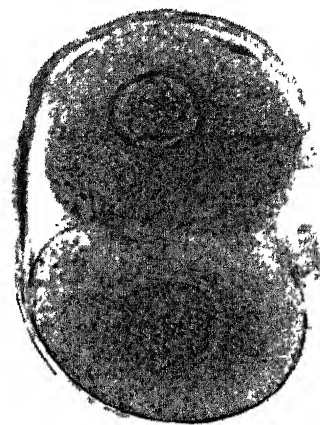
Change in season for giving immunizing "shots" against diphtheria and whooping cough was suggested following reports that children were more susceptible to poliomyelitis immediately after these immunizations.

An anti-poliomyelitis substance was discovered in human breast milk.

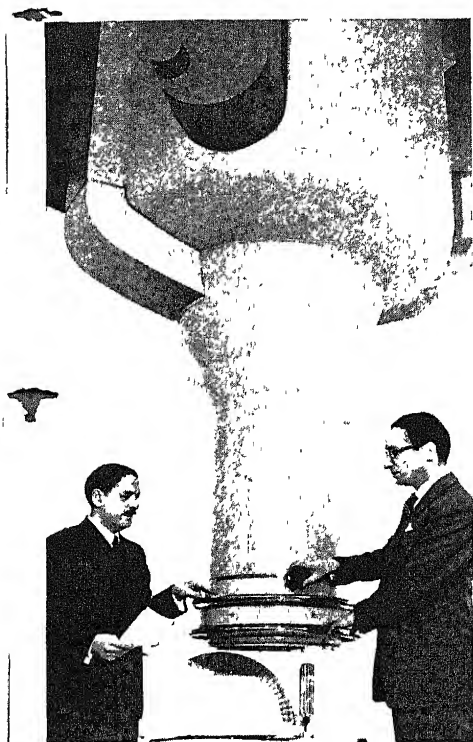
Poliomyelitis virus was grown for the first time in non-nerve tissue outside the body

Classification of three distinct types of poliomyelitis virus and continued search for possible other types was announced.

An anti-mumps vaccine became available



FIRST BABY PICTURE—Human fertilized egg photographed only 60 hours after fertilization, the youngest yet seen. It was reported by Drs. Arthur T. Hertig and John Rock of Harvard and the Carnegie Institution.



POWERFUL—This 2,000,000-volt X-ray machine for treatment is one of the largest of its kind ever built. It was recently dedicated at the Hospital for Joint Diseases, New York.

commercially for the first time.

A new B vitamin capable of reversing the toxicity for mice of an antifolate acid chemical used in treatment of leukemia was isolated and synthesized.

The white blood cell count was reported the best indicator that a person had absorbed a potentially dangerous dose of radiation.

First evidence of delayed effects of the atom bombs came from discovery of about 40 cases of cataract and an additional 40 suspected cases among survivors.

Lying down and keeping quiet, and the drugs, aureomycin, streptomycin and thiourea, were suggested as methods of countering radiation effects from atomic bombs.

Immediate penicillin treatment of streptococcal disease was suggested as a means of preventing rheumatic fever.

Lumpy jaw, acute nonspecific pericarditis, glandular fever, pemphigus, canker sores, and gas gangrene were added to the list of diseases that may be remedied by aureomycin.

Terramycin, new antibiotic drug active against whooping cough, pneumonias, gas gangrene infections, post-irradiation infections, urinary tract infections, scrub typhus, Q fever, Rocky Mountain spotted fever, rickettsialpox, amebiasis, and possibly influenza was announced.

Chloromycetin was found capable of preventing as well as curing scrub typhus.

Bacitracin was reported an effective remedy for amebic colitis.

Discovery of a new streptomycin, hydroxystreptomycin was announced.

New anti-tuberculosis chemicals undergoing trial were Tibione, a German drug, and a benzoic acid preparation called Benemid.

The Rh blood factor is linked with congenital

deafness, it was announced.

A jelly-like chemical, acid mucopolysaccharide, was found to be a constituent of the dentine and enamel of normal teeth and its disappearance was reported the first step in decay.

Penicillin tooth powder, believed effective against tooth decay, went on the market.

Controversy over the anti-histamines as remedies for the common cold continued, with the anti-anthistamine side apparently winning.

Somnoform, 25-year-old inhalant anesthetic used in dentistry, was reported best "truth serum" so far investigated.

An anti-histamine chemical with the trade-name diphenylpyraline was reported swiftly effective for relief of athlete's foot.

A polyphosphate was reported as an antidote for uranium poisoning.

Drinking salt water and soda was recommended as immediate emergency treatment for shock in case of large-scale disasters where blood and plasma might not be available.

Infusion of female sex hormones into veins or under skin for periods of hours was reported effective in relieving male and female patients with far-advanced cancers.

Statistical studies showing a causal relation between smoking and lung cancer were reported.

A new drug, Rq8, was reported successful in some cases of hitherto incurable cancers of lymph glands, bone marrow and other blood-forming tissues.

Radioactive cobalt was tried for cancer treatment.

Sex hormones may make radioactive phosphorus 15 to 20 times more effective in treating cancer, it was reported.

SK 1133 and Sk 1424, synthetic chemicals, were reported effective anti-cancer agents in laboratory animals.

A new drug for certain kinds of thyroid disease, 25 times as powerful as present anti-thyroid drugs, was discovered in 1-methyl-2-mercaptoimidazole or tapazole for short.

Acetylmethadol was reported as highly effective in reducing withdrawal symptoms when morphine was withheld from addicts.

Withdrawal of barbiturates from addicts with chronic barbiturate intoxication was found to cause temporary psychosis and other serious mental and physical reactions.

BAL, or British antilewisite, was reported successful as a treatment for lead poisoning.

A new, non-sugar sweetening agent, sucaryl, was discovered.

A new drug of the benzothiazole class, trade-named Asterol, was reported effective in ringworm of the scalp, athlete's foot and other fungus infections.

The digestive enzyme, trypsin, was found effective clearing up empyema from tuberculosis or other infections.

A new operation, denervation of the pelvic colon, was reported helpful in treating ulcerative colitis.

Methods were devised for determining the body fat and body water content of living human beings by specific gravity and blood plasma concentrations of antipyrine.

The Holger-Nielsen and the Eve methods for artificial respiration were shown to be superior to the Shafer method.

Acclimatization to severe work and heat stress results in a reduction of salt loss in the sweat.

The Nobel Prize in Medicine was awarded to Drs. Edward C. Kendall and Philip S. Hench of the Mayo Clinic and Dr. T. Reichstein of the University of Basle, Switzerland, for researches on the adrenal gland which led to development of cortisone.

PSYCHOLOGY-PSYCHIATRY

Find Seven Temperament Factors Can Be Measured

There are seven measurable factors of temperament, it was found: impulsiveness, pressure for activity, masculinity, dominance, emotional stability, sociability and reflectiveness.

Conflict among dominant members of a group does not necessarily result in combat between them, more often they take it out on a timid, submissive member, experiments with dogs demonstrated.

Individuals that learn to fight for food when young, will still squabble over food when adult even though not hungry then, experiments with mice revealed.

A method was reported for measuring shimmer due to small scale convection currents that cause air masses of different optical density to cross the line of sight, thus lessening apparent contrast of a dark object against a bright sky and interfering with its visibility.

The length of the dark periods between flashes of light necessary to see the light as flickering and not continuous was found to be determined by the central nervous system and not by the eyes; the flicker frequency is related to intelligence.

Blind adults of average intelligence can learn to understand the electronic reader that scans a printed page and translate the type into patterns of sound, it was found; speed was 36 words a minute.

(Turn to page 412)

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GENERAL SCIENCE

Wants Service for All

Conant and Bush urge putting all 18-year-old boys in uniform for two years of service. Gap in flow of trained men would not be serious, they believe.

➤ OPENING gun in the battle over what to do with a million 18-year-old boys every year has been fired by President James B. Conant of Harvard, wartime science mobilization chief Vannevar Bush and former Undersecretary of Army Tracy Voorhees. They ask that all 18-year-olds be put in uniform for two years of service.

Occasion for making the proposal was a press conference to announce the formation of a "Committee on the Present Danger," composed of college presidents, former government officials, elder statesmen and at least one prominent playwright.

The question will eventually have to be decided by President Truman and the Congress.

Essential differences in the two approaches to the problem of providing the nation with adequate military forces are:

General Lewis B. Hershey's educator and scientist advisers contend that the armed forces need a continuous flow of trained scientists, technicians and engineers coming out of college. They say putting all 18-year-old men in uniform for two years would,

later on, cut off this continuous flow for two years.

At the press conference, Drs. Conant and Bush said their plan would take young men before they had begun either college or productive life and that the gap in the continuous flow of trained men would be neither as serious nor as clear-cut as it might seem.

General Hershey's plan would provide deferment for all kinds of college training to those qualified. They contend that no one can now tell what will be "essential" training five or ten years from now. Who, before the last war, would have said that proficiency in the Korean language or in nuclear physics would turn out to be essential?

Dr. Conant conceded that there should be some "flexibility" about the two years of service. The military, he said, might send some of the men to college before their two years were up. Dr. Bush pointed out that many of the men would receive technical training in the Armed Forces.

Science News Letter, December 23, 1950

GENERAL SCIENCE

Opposes Service Plan

President Cavanaugh of Notre Dame holds some plan must be made to provide opportunity for training in college.

➤ FATHER John J. Cavanaugh, president of Notre Dame University, took issue with President James B. Conant of Harvard and Dr. Vannevar Bush, World War II science mobilizer, over their proposal for Universal Military Service.

"The experiences of World War II have proved the need, not only in time of war, but in the vital post-war period, of men trained in colleges and universities," Father Cavanaugh told Science Service. "Some plan, such as that endorsed by General Hershey, must be made for war emergency, to provide the opportunity for training on the undergraduate and graduate level."

Selective Service Director Lewis B. Hershey's plan calls for deferment of qualified high school graduates to go to college.

"I appreciate the concern of Dr. Bush and Dr. Conant over the present situation in which this country finds itself," Father Cavanaugh continued. "Maybe they, with better knowledge, see a greater urgency in that situation than I do."

"On the other hand, the present emergency may be of long duration. To meet the situation, a nation may not safely adopt a short-range policy. America is strong today, not chiefly by reason of the number of its men, but by reason of its wealth of trained manpower, of men capable of carrying on, not only the technological progress of the nation, but the moral and cultural progress as well."

Both Drs. Bush and Conant stressed the need for maintaining technological superiority over the communist part of the world. They did not believe, they said, that two years of military service at age 18 would seriously interrupt the flow of scientists, technicians and engineers trained to maintain that technological superiority.

Continued Father Cavanaugh: "I hardly think we wish to imitate the nations of Europe in the experience they have had with Universal Military Service."

Science News Letter, December 23, 1950

From Page 411

When magnetic tape recordings were cut and spliced it was found that it is possible to understand speech at a rate twice as fast as it is ordinarily spoken, thus saving transmission time.

Experimental evidence was found that the feeling of pressure is a mental concept, not a direct sensation and the mechanism located in the brain, not at the periphery of the body.

Normal individuals have an increased acuity in their sense of taste for sugar before meals and a decreased acuity after meals, it was found.

Teaching sculpture to blind persons was found to aid them in improving their orientation.

Exposure to oxygen lack equivalent to 30,000 feet altitude causes a loss of learning ability and re-learning ability, it was found through experiments with rats.

Pigeons were taught to cooperate in work and to compete in a ping-pong game, as well as to pick out tunes on a piano, they were found to be better laboratory animals for certain purposes than rats.

Two "natural enemies", alley cats and rats, were taught to work together cooperatively to get food, to eat, play, and live together in harmony.

A chimpanzee, adopted into a human family and raised from a few days after birth as a child, developed in a way closely parallel to that of a human child except for her speech, it was reported; she learned to speak three words and use them correctly, but only with great difficulty.

The group atmosphere of United Nations meetings is not conducive to thoughtful consideration of the merits of proposals, analysis of the official summaries of debates revealed.

A "lie detector" was used in combination with a very sensitive photo-electric recorder to spot the emotional abnormality often associated with juvenile delinquency; it reveals lack of emotional response to situations that commonly rouse emotions.

Radioactive phosphorus was successfully used in conjunction with a miniature Geiger counter probe to determine the extent of brain tumors.

The first case of a mental patient who choked himself to death by biting his tongue and holding his breath was reported.

A mental patient was saved from death after his temperature had gone up to 106 degrees in a state of acute excitement.

Mental patients who direct their aggression against themselves have a better chance of later recovery than those who attack others, analysis of accident and injury reports revealed.

Suggestions made under hypnosis were found to be effective two months later.

The depth of trance in a hypnotized person was measured by placing electrodes on the forehead and either hand of the individual and measuring voltage changes of the body.

Normal persons were found to be better liars than neurotics when under the influence of hypnotic drugs, or "truth serums."

Hypnotism was used to distinguish epileptics from other persons with seizures due to a psychoneurotic condition; the psychoneurotics could recall, under hypnotism, every detail of their surroundings during seizures.

The big-boned, muscular type of person has a much better chance of getting over serious mental disease, if he develops it, than those with low muscular development, study of over 1,000 consecutive patients showed.

Science News Letter, December 23, 1950

ASTRONOMY

Study Interstellar Glow

Faint glow of tenuous material between the stars can be observed only with fast spectrographs. It is only one-tenth as bright as earth's upper atmosphere.

➤ **LIGHT** from the tenuous material between the stars is being closely examined these days. Study of this faint material may give astronomers a clue to the number of extremely hot stars in different types of galaxies.

This interstellar glow is ten times fainter than the glow of the earth's upper atmosphere, noticeable on a dark night, reports Dr. Thornton Page of the University of Chicago's Yerkes Observatory.

Both in our own Milky Way galaxy, and in other clusters of stars and nebulae, the faint glow of interstellar gas can be studied only with fast spectrographs. Even with the best equipment, four to eight hours, and even longer, may be needed to trap the faint light on photographic plates.

The tenuous material between the stars can be detected in several ways:

1. Denser clouds show up as nebulae on astronomical photographs.
2. and 3. Distant stars seen through a large amount of interstellar material are reddened, and their spectra show absorption lines of interstellar gas.
4. Apparently dark parts of the sky between stars glow with a faint light whose

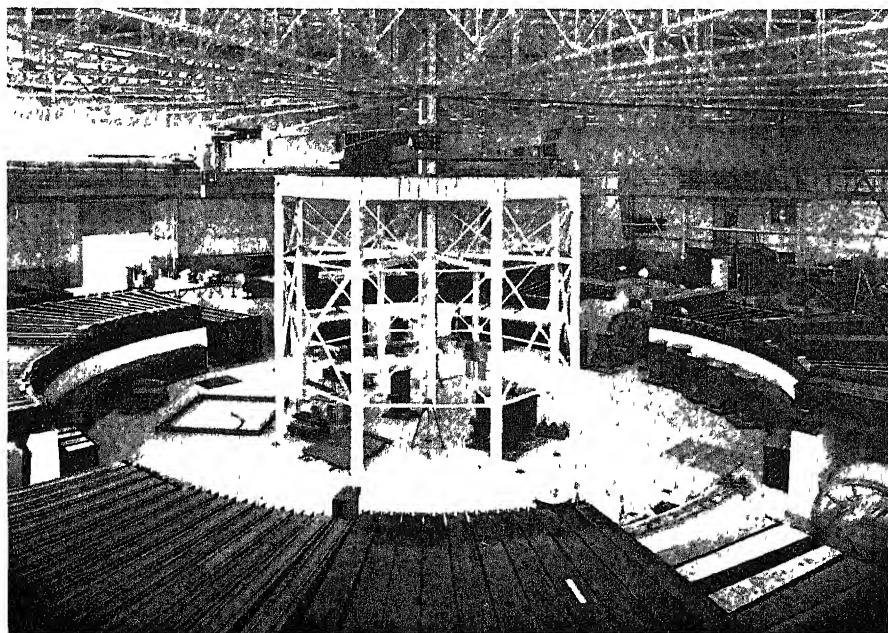
spectrum shows emission lines of hydrogen, oxygen, nitrogen and other gases.

The intensity of interstellar glow varies markedly from one galaxy to another. It is particularly strong in galaxies which contain many hot, blue stars, Dr. Page has found. This light may even reach a maximum of over 10% of all the visible light.

This glow is evidently produced by fluorescence in the interstellar gas from the strong and otherwise unobservable, far-ultraviolet light of hot stars, Dr. Page states. Reversing this reasoning, he hopes to find from intensity measurements with his fast spectrograph how many hot stars there are in different types of galaxies.

For the past two years Dr. Page has been using a spectrograph with a Schmidt camera attached to the 82-inch telescope of the University of Texas' McDonald Observatory to study this faint light. The Research Corporation recently made a grant to enable him to purchase a brighter grating for his spectrograph so he can study nebulae which are farther away and only half as bright as those now being scrutinized.

Science News Letter, December 23, 1950



GIANT—This six-billion-electron-volt bevatron, being built with Atomic Energy Commission funds at the University of California radiation laboratory, will guide protons in a precise path over a distance greater than that from the earth to the moon.

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GENERAL SCIENCE

Ten Top Science Advances

► THE TEN most important science advances during 1950 as picked by Watson Davis, director of Science Service, are.

1. Beginning of intensive development of the "hydrogen" super-bomb
2. Dating of archaeological objects up to 25,000 years old by radiocarbon atomic "calendar" with consequent re-dating to about 10,000 years ago the last Ice Age and arrival of man in America.
3. Inauguration of weather forecasts for 30 days ahead by U. S. Weather Bureau, issued twice a month
4. Decision by FCC authorizing commercial broadcasting of color television.
5. Measurement of seven factors of temperament: impulsiveness, pressure for activity, masculinity, dominance, emotional stability, sociability and ineffectiveness.

6. Development of new blood processing method that separates red cells, white cells, platelets and essential plasma fractions within six hours.

7. Two new elements number 97 and 98 created by atomic bombardment and named berkelium and californium.

8. Discovery that Proxima Centauri, star nearest solar system, has frequent and gigantic flare-ups

9. Discoveries of large meteor crater in Quebec and lofty mountain range on floor of Pacific.

10. Continued successful use of cortisone and ACTH in rheumatic diseases and extension of use to burns, malignant conditions and inflammatory diseases of eyes and blood vessels.

Science News Letter, December 23, 1950

GENETICS

Fears Global Chaos

Geneticist feels that disaster may come before man learns to harness solar energy for food production or stabilize population growth.

► THE GREATEST danger of this century is that global chaos will prevail before man has succeeded either in harnessing solar energy for new methods of food production or in stabilizing his own reproductive rate, Dr. Paul C. Mangelsdorf, Harvard University geneticist, told the American Academy of Arts and Sciences meeting in Boston.

Development of hybrid corn, in Dr. Mangelsdorf's opinion, has been one of the most important factors in saving American culture and European civilization during World War II and afterwards. During the war food production in the United States was stepped up 20% when desperately needed, largely because of the increased production of corn. Since the war, our corn surplus due to hybrid corn made it possible for America to ship to western Europe enough food of various sorts to stem the rising tide of communism there.

"Perhaps Russian antipathy to Mendel's laws of heredity on which hybrid corn development is based is not unfounded," Dr. Mangelsdorf said.

It is difficult for Americans, he said, to realize that two-thirds of the world's people are inadequately fed and suffering from chronic malnutrition, while Americans live in a land of agricultural surpluses and taxed to maintain scarcity prices in the face of plenty.

Yet the world's population is increasing at the unprecedented rate of 22 million people per year and this rate promises to accelerate still further before it begins to decline.

Dr. Mangelsdorf does not agree with those who believe the United States alone can feed the world, continuing indefinitely to produce and export food surpluses. This would be a short-time palliative and exporting food is shipping abroad a part of America's permanent soil fertility.

Learning to utilize solar energy to continue a flow of luxury energy and controlling unrestricted growth of population is suggested by Dr. Mangelsdorf as a way out of the disaster facing the world

Science News Letter, December 23, 1950

GENERAL SCIENCE

Try To Prevent Enlistment of Research Men

► THE NAVY and the Atomic Energy Commission are making efforts to prevent the enlistment of young scientists doing research work essential to the national wel-

fare in universities and in industrial and other private laboratories. A growing number of these young men are enlisting or refusing to ask for deferment in order to get away from what they feel is the stigma of not being in uniform

First step in this effort was a statement signed by Chairman Gordon Dean of the AEC and Undersecretary Daniel A. Kimball of the Navy Department which appears in the magazine SCIENCE (Dec 15). The statement is designed to bring home to the young scientists the importance to defense of their work as civilians. It reads

"One very essential condition for maintaining our national strength, whether for peace or for war, is that the research in the sciences which is basic to all technological progress be kept at a high level. The scientist in his laboratory and the research professor with his graduate students are performing a service which may make a critical difference to our country in the difficult years ahead. In particular, the Department of the Navy and the Atomic Energy Commission consider a high level of basic research in the sciences essential to the continued progress of their respective programs"

Science News Letter, December 23, 1950

MEDICINE

Itching Skin Relieved by Bromine and Calcium

► THE ITCHING, weeping symptoms of some skin diseases can be relieved by a compound of calcium and bromine, Dr. William Parker of St. Louis reported (JOURNAL, MISSOURI STATE MEDICAL ASSOCIATION.)

The sedative effect of the bromine ion has long been known. Dr. Parker believes it is soothing in skin trouble because the skin and the brain and central nervous system are related on an embryologic basis. The calcium in the combination he uses acts as an anti-inflammatory agent by decreasing permeability of the cells. This counteracts or stops the weeping so troublesome in some skin disorders.

Calcium bromide-galactogluconate, with the trade name of Calcibronat, is the compound he uses. It is sold only on prescription.

Science News Letter, December 23, 1950

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AMERICAN GLASS—Valentine Van Tassel—*Barlows*, 191 p., illus., \$2.00. A brief history of one of America's first industries. Well illustrated.

AMERICAN LITHOGRAPHS OF THE NINETEENTH CENTURY—Helen Comstock—*Barlows*, 170 p., illus., \$2.00. A brief history. Many famous lithographs are reproduced in black and white.

CHEMICAL PROBLEMS OF THE AUTOMOBILE INDUSTRY—C. L. McCuen—*General Motors Research Laboratories Division*, 17 p., illus., paper, free upon request to publisher, 3044 West Grand Blvd., Detroit 2, Mich.

THE CHEWING GUM TREES—Ruth Bishop Juline—*Lothrop, Lee & Shepard*, 122 p., illus., \$2.50. The story of a Chiclero and his adventures in obtaining sap for chewing gum. For ages 8-12.

CHYMIA—Annual Studies in the History of Chemistry, Vol. III—Henry M. Leicester, Ed-in-chief—*University of Pennsylvania Press*, 251 p., illus., \$4.50.

COFFERDAMS—Lazarus White and Edmund Astley Prentiss—*Columbia University Press*, 2nd ed., 311 p., illus., \$10.00. Presentation of theoretical considerations of hydrodynamics of seepage forces, stream erosion and lateral earth pressures for cofferdams.

EMPLOYMENT OUTLOOK IN PETROLEUM PRODUCTION AND REFINING—Bureau of Labor Statistics—*Gov't. Printing Office*, U. S. Dept. of Labor Bull. No. 994, 52 p., illus., paper, 30 cents.

ENCYCLOPEDIA OF THE EYE. Diagnosis and Treatment—Conrad Berens and Edward Siegel—*Lippincott*, 272 p., illus., \$5.00. A reference book for the general practitioner.

FLUORINE CHEMISTRY, Vol. I—J. H. Simons, Ed.—*Academic Press*, 615 p., illus., \$12.00. A reference book written on many aspects of fluorine chemistry by well known authorities such as Anton B. Burg, Donald Ray Martin and W. A. Weyl.

HIGHER EDUCATION IN THE NATIONAL SERVICE—Francis J. Brown—*American Council on Education*, 151 p., paper, \$1.50. A report of a national conference held in Washington, D. C., Oct. 6-7, 1950.

JOURNAL OF ATMOSPHERIC AND TERRESTRIAL PHYSICS, Vol. I, No. 1—Edward Appleton, Editor-in-Chief—*Butterworth-Springer* (U. S. Distributor: Academic Press), 64 p., illus., paper, \$9.50 per volume. A new journal.

MANUAL OF BASIC TRAINING, Vol. II: Atomic Warfare—Home Office Civil Defense—*His Majesty's Stationery Office*, (U. S. Distributor: British Information Services), 60 p., illus., paper, 50 cents. A short manual of practical information.

A MANUAL OF PLASTICS AND RESINS: In Encyclopedia Form—William Schack, Ed.—*Chemical Publishing Co.*, 547 p., illus., \$10.00. A survey of the materials, processes, products and equipment of the plastics industry.

METHODOLOGY AND TECHNIQUES FOR THE STUDY OF ANIMAL SOCIETIES—J. P. Scott, Consulting Ed.—*New York Academy of Sciences*, 119 p., illus., paper, \$2.50. Result of a conference held on Nov. 12 and 13, 1948.

THE MEXICAN CULTURAL MISSION PROGRAMME—Lloyd H. Hughes—*UNESCO*, (U. S. Distributors: Columbia University Press), 77 p., illus., paper, 45 cents. Description of a Mexican experiment in improving rural community life.

NEW BIOLOGY—M. L. Johnson and Michael Abercrombie, Eds.—*Penguin* (U. S. Distributor: Allen Lane), No. 9, 128 p., illus., paper, 35 cents. A collection of short articles for the general reader. Includes text of the recent UNESCO statement on race problems.

1950 BITUMINOUS COAL ANNUAL—*Bituminous Coal Institute*, 200 p., illus., paper, 85 cents. Facts and figures of the industry for the year.

THE PHARMACEUTICAL INDUSTRY IN GERMANY DURING THE PERIOD 1939-1945—J. B. M. Coppock—*His Majesty's Stationery Office* (U. S. Distributor: British Information Services), 120 p., illus., paper, 90 cents.

PHYSICIAN TO THE WORLD: The Life of General William C. Gorgas—John M. Gibson—*Duke University Press*, 315 p., illus., \$4.50. The biography of the man who waged a successful war against yellow fever.

RADIOACTIVE TRACERS IN METALLURGICAL RESEARCH—W. S. Eastwood and others—*His Majesty's Stationery Office* (U. S. Distributor: British Information Service), 55 p., illus., paper, 40 cents. Intended to facilitate use of isotopes in British research.

RESEARCHES ON FUNGI, Vol. VII: The Sexual Process in the Uredinales—A. H. Reginald Buller—*University of Toronto Press* (Trade Distributors: S. J. Reginald Saunders), 458 p., illus., \$13.50.

RESEARCHES ON THE RADIOTHERAPY OF ORAL CANCER—Constance A. P. Wood and J. W. Boag—*His Majesty's Stationery Office* (U. S. Distributor: British Information Services), 148 p., illus., paper, \$2.85.

SCIENCE NEWS—J. L. Crammer, Ed.—*Penguin* (U. S. Distributor: Allen Lane), No. 17, 156 p., illus., paper, 35 cents. Among the articles included are Physics and Metaphysics by Max Born, My Attitude to Quantum Theory by Albert Einstein and Finding Water by Cyril S. Fox. Of British origin.

THE SOCIAL AND BIOLOGICAL CHALLENGE OF OUR AGING POPULATION—Proceedings of the Eastern States Health Education Conference, March 31—April 1, 1949—*Columbia University Press*, 183 p., illus., \$2.75.

SOME FAMOUS STARS—W. M. Smart—*Longmans, Green*, 219 p., illus., \$2.50. Lectures delivered in the early months of 1949 in the Royal Technical College, Glasgow.

STAMPEDE TO TIMBERLINE: The Ghost Towns and Mining Camps of Colorado—Muriel Sibell Wolfe, 544 p., illus., \$7.50. A history of 240 of Colorado's mining camps. Many black and white illustrations.

STUDIES IN LEADERSHIP: Leadership and Democratic Action—Alvin W. Gouldner, Ed.—*Haper*, 736 p., illus., \$5.00. Specialists on leadership from various social sciences have contributed to this volume.

YEARLY SURGICAL DIGEST—Richard A. Leonardo—*Froben Press*, 293 p., paper, \$3.00. A summary of current surgical practice.

Science News Letter, December 23, 1950

ENGINEERING

Nylon Used as Base For Fine Metal Tubes

► A NEW use for nylon unrelated to stockings or other familiar articles is reported from Sweden's Research Institute of National Defense. Drawn nylon fibers can be used as a base upon which to deposit electrolytically very fine metal tubes useful in electronics and instruments.

Other materials have been used in this way, but they have been very hard to remove from the inside of the tube, particularly when the walls are thin and of small diameter.

The method of making the small metal tubes was communicated by Dr. Rolf J. E. Gezelus, a Swedish scientist, to the REVIEW OF SCIENTIFIC INSTRUMENTS (October).

Science News Letter, December 23, 1950

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Top Patents of The Year

If you want the patent number of the inventions described here send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N. St., N. W., Washington, 6, D. C. and ask for Patent Bureau Bulletin 1950.

Notable and interesting inventions patented during the year include:

Electrically-heated mat to keep doorsteps and walk clear of snow and ice.

Device on panel of pilot's cockpit showing at a glance the thrust of a jet engine while on the ground or in the air.

Free-flying pilotless balloon, that will rise to a certain height and remain floating about at that altitude, designed for carrying weather recording instruments.

Improved method for making ammonium sulfate for fertilizer obtaining the product in a substantially dry and free-flowing form.

Improved automobile polish containing silica and a silicone product.

Cold pressure process for welding such metals as aluminum and copper without the use of hot flames.

Stainless steels in many colors, for interior fixtures and furniture, varying from yellow to purple when chemically treated in a special process.

Windshield for microphones that permits better radio broadcasting from outdoor windy locations.

New type coal-mining machine eliminating drilling, blasting and loading by ordinary methods, doing all in a continuous operation.

Heating equipment for use in applying lacquer, varnish and paint as a hot spray.

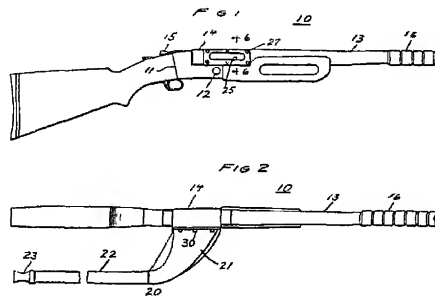
Simple electroplating process that applies protective coatings of chromium-molybdenum alloys on iron, copper and other metals.

Small-size silencer to decrease noise from a low-flying airplane engine.

Improved fluid for use in refrigeration and air-conditioning composed of a mixture of propane and monochlorodifluoromethane.

New method of taking X-rays in three dimensions which permits a doctor to see the inside of a patient in actual perspective.

Television camera that can pick up a dis-



tant object in total darkness by means of invisible infra-red radiation.

High frequency radio warning device to give the engineer of a speeding train a continuous warning of another train on the track ahead.

Continuous-process machine to convert raw peat into a suitable fuel in compact tubular form for use in American heating installations.

Recoilless gun, a one-man military weapon, that will fire two-pound shell with no greater kick than an ordinary shotgun.

"Workable" stainless steel which can be shaped and fabricated in a relatively soft condition and then hardened by heat-treatment.

Germanium united with nitrogen to form a material which will give off electrical energy when subjected to light or heat.

Continuous-flow paint brush supplied with paint by a paint-holding pressure tank carried

on the back with a tube from tank to the end of the paint handle.

An anti-perspirant type of cosmetic based on aluminum methionate.

Automatic carbon dioxide fire extinguisher to lessen danger from film-fires in operating motion picture projectors.

Cross-wind airplane landing gear which permits landing a plane in safety on a single runway field regardless of wind direction.

Method of using germanium and other semiconductors in electrical amplifiers.

Low-cost equipment to clear industrial water contaminated with oil and dirt and permit re-use of the water.

Process for drying green lumber more quickly than by usual methods employing chemical treatment with ammonium carbonate or a mixture of urea with sodium bicarbonate.

Better magnets of the permanent type containing zirconium and titanium in a magnetic alloy to decrease brittleness.

A soybean gel, which contains the protein contents of the bean, as a gelling constituent for foods containing meats or for puddings.

Heat-resistant paint, containing methyl silicone resin, boric acid and a lead compound, designed to withstand temperatures around 1000 degrees Fahrenheit.

Air-cooled spark plug for use in the high temperatures of gas turbine combustion chambers.

Process to freeze eggs, with shells removed, which keeps in all their freshness.

Do You Know?

Indigestion is often caused by eating too rapidly so that food is insufficiently chewed.

Newsprint in India is to be made from a wood known as *selai* that is plentiful in that country.

Pickle liquor, in the steel industry, is a mixture of sulfuric acid and ferrous sulfate that results from a process employed to remove scale and rust in steel manufacture.

Titanium, which may soon become an important structural metal by itself, has been used for at least 50 years as an alloying material in steelmaking.

Heavy rails in railroad tracks are essentials for speed with safety; nearly half those now being produced weigh 120 pounds or more per yard.

ATOMIC BOMB FIRST AID

A series of pertinent, up-to-date articles, published in SCIENCE NEWS LETTER, prepared by Jane Stafford, Science Service Medical Writer, with the cooperation of the American Red Cross and other sources . . .

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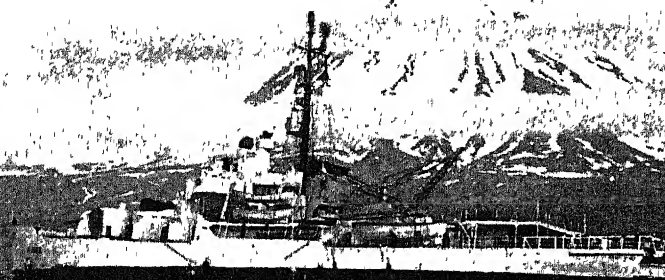
T. MAR 1951

December 30, 1950

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THE WEEKLY SUMMARY OF CURRENT SCIENCE



Northwind

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A SCIENCE SERVICE PUBLICATION

\$5.50 A YEAR

VOL. 58 NO. 27 PAGES 417-428

ASTRONOMY-BALLISTICS

Meteor Like Rocket Front

For the same reason that a shooting star shines brightly as result of friction from the air, the front of a rocket also glows dull red.

► WHY A METEOR shines brightly as friction with the air heats it to high temperature is essentially the same problem as the heating of the front of a rocket traveling at one or more miles per second through the upper air. V-2 rockets have been seen to glow dull red as their tips were heated by this atmospheric friction.

The boundary that separates our knowledge of high-velocity rocket ballistics and the astronomers' knowledge of what happens to meteors as they plunge earthward has probably been crossed as a result of investigations still in progress. Dr. Richard N. Thomas of the University of Utah and Dr. Fred L. Whipple of Harvard College Observatory described to members of the American Astronomical Society meeting at Strawbridge Observatory, Haverford, Pa., their current joint investigations of astrobolic heat transfer.

These astronomers have calculated the rate of heat transfer in the region where a solid body such as a meteor is just beginning to melt. They find that the transfer varies directly as the air density rather than with the square-root of the density as used in current aerodynamic theory.

The heat transfer is something like ten times more efficient at the high speeds of meteors, which are racing through space ten to forty miles per second when they enter our atmosphere, than at the speeds of our present fastest rockets.

With his associates Dr. Thomas computes the temperature of the glowing surface of a meteor to be about 3,000 degrees Centigrade when at its brightest.

Further work is being done to determine the maximum size of a meteor that can reach the ground in one piece, this depending partly on the rate of deceleration of the meteor as it falls.

What Is Temperature?

WANTED: New definition of temperature.

Dr. Charles Hetzler of Brown University pointed out to those attending the meeting at Haverford College that astronomers themselves have been guilty of considerable confusion.

Temperature to the man in the street is something he feels by his sense of touch. Actually, it is a result of the transfer to his skin of the energy of molecules in the air or in solid substances. Or it may be received directly from the radiant energy of the sun, a sun-lamp, a stove or radiator, or just from the walls of a room.

To a physics student, temperature is proportional to the average kinetic energy of the particles in a given volume of a substance, a gas being the simplest case. Astronomically, the surface temperature of a star is that to which an idealized mass of material, called a "black body," would have to be raised to duplicate the radiation spectrum of that star.

But in the outermost regions of the sun's atmosphere, where the density is that of a vacuum and there couldn't possibly be enough particles to make one feel hot were he located there, astronomers find evidence that the atoms are or have been at one time very hot.

These particles of the sun's corona have lost serious numbers of their outermost parts, or ring electrons. The only way known for this to take place is for such atoms to have been knocked around quite badly at temperatures of millions of degrees known to prevail inside the sun and other stars, or to have been subject to the terrific X-ray radiation that must accompany such high temperatures at the high densities found in the sun's and star's interiors.

All of which, Dr. Hetzler points out, leaves the concept of temperature in a rather confusing state. Bringing in the concepts of relativity, he suggests that "temperature is a measure of the density, in space and time combined, of the relative motion."

The temperature at a point therefore depends on the total energy of the motion, including atomic, molecular, electronic, and the like, relative to the unit volume about that point per unit time.

Science News Letter, December 30, 1950

MATHEMATICS

Machines Can Play Chess; But Human Should Win

► MACHINES can learn to play chess and other games, a British mathematician, Dr. J. Bronowski, argues in a discussion being conducted in columns of the leading British scientific journal, NATURE (Dec 16).

Dr. Bronowski, who during World War II conducted bombing studies, and who now is with the Central Research Establishment of the National Coal Board, argues that while it is true that a machine cannot learn unless it is provided with a mechanism for learning, it is quite possible to devise such a mechanism.

Machines can be designed to make the best move at each step in a game of tic-tac-toe or chess, Dr. Bronowski reports.

"When playing against a series of human opponents, such a machine may never do much better than draw. A good human player against the same opponents may score more wins by making unsound but more puzzling moves," he says.

A machine can be made to imitate the human player, instead of playing perfectly, it can be made to play well, by the inclusion of an empirical or statistical mechanism in three units. One unit makes the machine experiment with different alternatives each time certain positions are reached; the second unit counts the results and relates them to the alternatives chosen, and the third steers the machine into the lines of play which have been winning most often.

"Indeed, the mechanism may be made more subtle," Dr. Bronowski states. "The second unit could also be made to classify players, say by their opening moves, into the bold and the timid. The third unit would then, in a given end game, choose the move which had won most often against players of that type."

By putting in a mechanism which estimates the probability of success in the future by analyzing the distribution of successes in the past, it is possible to devise a machine so that it learns, matures and even develops a style.

"Perhaps this is not the way in which animals learn," Dr. Bronowski observed, "or perhaps, on the contrary, it is the very reason why animals play games at all. But I am confident that the inclusion of such statistical mechanisms will be an important development in machines. I can speak for its usefulness in strategic problems, for I myself used it in a rudimentary form in bombing studies, in those spacious days when we worked with punched cards."

Science News Letter, December 30, 1950

METEOROLOGY

Billion Tons of Air Moved to Make Weather

► BEFORE scientists get any fancy notions about making weather to order they had better sit down and figure out a way to move a billion tons of air. That is the amount of air that has to be shifted to make a reasonable area of depression, according to Sir David Brunt, professor of meteorology at London's Imperial College, who calculated it all out to an accuracy of within two per cent.

It is the movement of cold air from a high pressure area into an area of depression that is the major factor in weather making, he told the Royal Institution.

Until science develops a way to move that billion tons of air, it just will not make much of a depression—or impression on the weather for that matter.

Science News Letter, December 30, 1950

MEDICINE

Gamma Globulin for Polio

Blood factor also used against measles believed useful in warding off infantile paralysis attacks. Trial on every other child in a community needed for test.

➤ **NEEDED** for polio fighting next summer: A community of brave, intelligent parents. They must be brave enough and smart enough to let their children be the guinea pigs in trial of a safe but not sure method of warding off the disease.

The method would be injections of material from blood, called gamma globulin. Many children now get gamma globulin to ward off or make less severe an attack of measles. The gamma globulin fraction of blood plasma contains substances called antibodies that give resistance to disease. They get into the blood as the result of infection with the disease germs.

Laboratory studies have gone far enough now to show that gamma globulin might be useful in warding off poliomyelitis attacks, Dr. William McD. Hammon of the University of Pittsburgh believes. He gives his reasons in a report to fellow physicians in the medical journal, *PEDIATRICS* (Nov.)

But in order to be sure the gamma globulin will protect children from polio there must be a careful trial of it. This is where the brave parents come in. Because in the trial, the material should be given

to every other child in a community. Some will have to miss the chance of getting polio protection. No one but the scientist in charge will know which child gets the gamma globulin and which gets some harmless, inactive material. At the end of the polio season, a tally will be made to see whether there were more cases of infantile paralysis among the children who did not get the gamma globulin.

Unless the trial is made in this way, Dr. Hammon emphasized, no one will ever know whether gamma globulin can protect children against polio. This is because in every epidemic some children get sick and others escape the disease. If every child is given gamma globulin, no one will know whether those who stayed well would have stayed well without the globulin.

So far as Dr. Hammon knows, no plans for this kind of controlled trial of gamma globulin against polio next summer have yet been made. He hopes such a trial can be made.

Even if gamma globulin does get a trial and proves effective in warding off polio, it is not a perfect solution to the problem. For one thing, it gives what doctors call

passive immunity. This is not lasting. Probably it only lasts four to six weeks, while the polio season runs for several months. Consequently children would have to get shots of gamma globulin several times through the season. The proper dosage has not yet been determined.

Best hope for an effective way of dealing with polio, in Dr. Hammon's opinion, is the development of a drug to stop the disease. He does not think active vaccination against it, such as vaccination against smallpox or shots against diphtheria, will be the answer.

So far, no effective anti-polio drug has been discovered. But the prospect is encouraging, because some drugs have been developed which are effective against some other viruses. Some day, Dr. Hammon thinks, one will be discovered which will check the polio virus.

Science News Letter, December 30, 1950

MATHEMATICS

Number 1951 Is Mathematical Curiosity

➤ **THE YEAR 1951** is just a few days away. Irrespective of what it may have in store for us and for the world, the number itself is peculiar from a mathematical point of view.

First of all, 1951 is a prime number. No matter how hard you try, the only numbers you can find that divide into it evenly are itself and unity. Secondly, it is a twin prime, since 1949 was also a prime number. The numbers 11 and 13, 17 and 19 are also twin primes, but twin primes among the higher numbers are quite rare.

We shall not again have another such pair of twin primes in our dates until the end of the century, points out Prof. Oystein Ore of Yale University. The next twin primes are 1997 and 1999, to be exact.

Science News Letter, December 30, 1950

ARCHAEOLOGY

Flint Store Believed Money of Ancient Indian

➤ **FLINT PIECES** that may have been part of the wealth of a prehistoric Indian are now at the University of Illinois.

The pieces range from raw blocks to expertly fashioned big spear points. Prof. John C. McGregor, University of Illinois archaeologist, believes the spearheads are much too finely-made to have been used for hunting or war. Most likely they were a medium of exchange, he has concluded.

The cache was uncovered in Calhoun county between the Mississippi and Illinois Rivers, northwest of St. Louis. In this area are many remains of the prehistoric Hopewell or mound-builder Indians. Radiocarbon dating set the time of their culture at 200 to 600 B.C.

Science News Letter, December 30, 1950



BURIED TREASURE—These flint pieces, recently dug up, may have been "money" laid away by some prehistoric Hopewell Indian some 2,400 years ago. They are much too finely worked to have been made for hunting or war.

MEDICINE

New Respiration Method

Combination of Schafer prone pressure method with a hip-lift or hip-roll method was tried out on 100 warm corpses and nine living men.

➤ A NEW method of giving artificial respiration to restore life, tried out on 109 warm corpses and on nine living men who voluntarily stopped breathing for the experiments, is announced in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Dec. 23)

The method was developed by Dr. A. C. Ivy and associates of the University of Illinois College of Medicine. It consists of a combination of the Schafer prone pressure method and a hip-lift or hip-roll method.

The "ventilating efficiency" of the prone pressure method, taught in American Red Cross and other first aid classes, can be doubled by adding the hip-lift maneuver, Dr. Ivy and associates found. By ventilating efficiency is meant the amount of air that gets into the lungs.

To use the new method, the operator lifts the victim's hips four inches 12 times a minute, alternating this with the push on the chest of the prone pressure method. Since lifting the hips is tiring, after the first crucial few minutes it may be done after every second or third push on the chest. The hip roll was developed as a less tiring, easier method of accomplishing the ventilation of the hip-lift maneuver. To do this, the victim is grasped at the distant hip and "rolled" onto the rescuer's knee and back again.

Dr. Ivy and associates compared the efficiency of eight methods of manual artificial respiration and the Eve rocking method in which the victim is rocked on a board like a child's see-saw. They found that the manual methods in which the victim lies prone or on his back and which use both a push

and a pull are more effective than those using only a pull or only a push, such as the Schafer method. The prone, or face down, method was found safer.

The study was assisted by a grant from the American Red Cross. Red Cross authorities in Washington stated that they will make trials of the new hip-roll prone pressure method in some of their classes, before deciding whether to adopt it officially. The method now taught ventilates the lungs as well as normal breathing does, Dr. Ivy's studies show. Consequently Red Cross authorities do not believe it wise to change the method yet, especially as the hip-roll procedure is harder and takes more strength.

Emphasized by Dr. Ivy and associates is the importance of the first few minutes in starting artificial respiration. Those working on the study with Dr. Ivy were. Drs. Archer S. Gordon, Frank Raymon, Max Sadove and David C. Fainer.

Science News Letter, December 30, 1950

MEDICINE

ACTH Helps Patients With Tendency to Bleeding

➤ ACTH and cortisone, famous for the relief they bring to arthritis-crippled joints, are helping patients with a tendency to excessive bruising and bleeding. The condition is known as idiopathic thrombocytopenic purpura. It is due to failure of the bone marrow to produce enough blood platelets.

"Remarkable results" in ACTH treat-

ment of three patients with this disease are announced by Dr. Muriel C. Meyers of the University of Michigan.

The patients not only improved but have remained well, with no relapses, for more than six months since the treatment was stopped.

ACTH failed to help two other patients with this disease, but they were then given cortisone and got good results from that drug.

Science News Letter, December 30, 1950

SCIENCE NEWS LETTER

VOL. 58 DECEMBER 30, 1950 No. 27

45,600 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W., Washington 6, D. C., North 2255. Edited by WATSON DAVIS

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00, 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1943 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N. Y. C., P. E. N. S. I. 6-5566 and 360 N. Michigan Ave., Chicago. STATE 2-4822

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Question Box

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PUBLIC HEALTH

How does cholera spread? p. 424.

Photographs: Cover, U. S. Coast Guard; p. 419, University of Illinois, p. 421, U. S. Coast Guard.

GENERAL SCIENCE

Plan for Brainpower

Six Scientific Advisory Committees to Selective Service offer recommendations for best utilization of scientific and technological skills and continuance of training.

➤ **MANPOWER PLANS** — and specific plans for scientific, technical and engineering manpower—are legion around Washington. The plans which many men have proposed, Congress and the President will dispose after Jan 1

Since scientific and technological skills are the most critical of all our skills, planning for them has come first. It is considered likely that whatever plans for the utilization of these skills are adopted, they will be adapted for all personnel whose skills take two years or more to acquire.

After Jan 1, Congress proposes to amend the current draft law. The legislators then will decide whether to make deferments—either for training or for critical work—part of the new law—or leave the spelling out of these matters to the Executive.

One plan, based on two years of work, was presented recently in Washington. It was the work of the six Scientific Advisory Committees to Selective Service Director Lewis B. Hershey, Dr. M. H. Trytten, chairman.

This presentation was made at a meeting to which were invited more than 300 college presidents, scientists and government officials. Since Harvard President James B.

Conant's plan for Universal Military Service for all 18-year-old men had just previously been launched with considerable publicity, the committees felt it advisable to explain to the public the facts on which they worked and the line of thought they followed. Science News Letter herewith presents condensations of the four presentations:

The Facts

By E. LOWELL KELLY

*Professor of Psychology
University of Michigan*

➤ **THE COMMITTEE'S** objective is the objective of every thinking citizen: let us move as rapidly as possible to make our nation strong in all ways and let us plan so as to maintain that strength through the many uncertain years ahead.

We wish to call your attention to a series of facts these Committees were forced

to consider. Furthermore, they are facts which dare not be overlooked by anyone making recommendations or decisions with respect to manpower utilization.

Our total population is about 150 million. It is anything but large when compared with the population and manpower resources of our potential enemies. Something less than half is gainfully employed. The other half is composed of persons too young or too old to work or busy as housewives and mothers.

At the maximum during World War II, only about 11,000,000 men were in uniform. This figure could probably be exceeded somewhat but it does serve to remind us of a definite limitation on the maximal size of a military force.

The second fact concerns the supply of new manpower each year. This figure is largely determined by the number of male babies born 18 or 19 years before, currently, about one million males. Even with reasonably liberal physical standards, it seems unlikely that more than 800,000 of the one million might be acceptable for military service.

The actual number of men to be drafted and the length of time they will be required to serve is primarily a function of the size of the armed force to be maintained.

Assuming a defense force of three million and assuming a million newly available men each year, a continuing force of this size could be maintained only if each

ENGINEERING

Alaskan Outposts Get "Northwind" Delivery

See Front Cover

➤ **BRINGING SUPPLIES** and fuel oil to lonely outposts in Alaska is a U. S. Coast Guard job that can be both wet and hazardous.

The Coast Guard's \$10,000,000 icebreaker "Northwind" has just finished the annual delivery to the country's most remote military installations, tiny stations scattered along the rockbound Alaska shores from the Canadian border to the Bering Sea.

Oil for an entire year must be delivered to each installation. To do it, the icebreaker carries a 10,000-gallon barge on her deck where a helicopter would normally ride.

The barge is loaded with oil from the ship's tanks and towed ashore by a landing craft. Sometimes, where there is no beach, the barge must remain offshore and the oil is pumped through hundreds of feet of hose.



BATTLING WAVES—Coast Guardsmen fight the elements for nearly half a day during refuelling operations at Cape Hinchinbrook Light Station, Alaska.

young man served for three years. Many people have concluded that our problem can best be met by requiring a period of two to three years of military service for all men shortly after becoming 18 or 19. Attractive as this solution is by virtue of its simplicity, it fails to take into consideration additional facts which our Committees believe to be demanding of attention.

The first of these is that the free nations of the world are not able to match their potential enemies on the basis of manpower alone. This means that our hope for survival must depend not on numbers alone, but on the superior utilization of manpower. To our Committees this means that every person must serve his country in a capacity which permits him to make the greatest contribution to the national welfare.

Modern society is becoming increasingly complex and so is modern warfare. The cold war has emphasized the importance of technological developments such as psychological warfare which are based on fields of specialization other than those ordinarily regarded as contributing to the direct military application. This rapid increase in the role of scientific and technological devices and services has been paralleled by a mounting demand for scientists, specialists, and other professional personnel in the military services, in government agencies, and in the civilian economy. *We dare not overlook the fact that these specialists cannot be trained in a matter of a few months.* For many fields of specialization the training of personnel must be planned in terms of four to eight years. There are simply not enough trained scientific specialists and professional personnel to meet the nation's needs for even a short period of large scale mobilization.

The facts to which our Committees have given serious and recurring attention are those all too often overlooked in considering the problem of manpower utilization. We tend to overlook the incontrovertible evidence concerning the ways in which men differ with respect to the manner in which they can best serve the nation.

The known differences among men are related to their ability to perform useful functions in our society. For example, although the average child develops mentally at a rate which permits him to learn to read at the age of 6 or 7, there are other children whose mental development never proceeds far enough for them to learn the meaning of printed symbols. At the other end of the human ability scale, we find children whose mental development is as accelerated as that of the feeble-minded child is retarded.

It is a fact that later ability to perform in complex adult situations is closely related to ability to perform in our typical American schools. Psychologists who have studied the problem in considerable detail refer to this ability as "scholastic aptitude."

It seems to be primarily a matter of ability to manipulate words and numbers and to think in terms of abstract relationships.

The distribution of human ability in our male population is measured by the Army General Classification Test. The scale, ranging from 40 to 160, represents the range of human ability as measured in AGCT units. This is an arbitrary scale which has been developed by assigning a value of 100 to the test score made by the average male adult and the other values were determined by the actual distribution of scores made by large numbers of Army personnel. Slightly over two-thirds of all men make scores falling between 80 and 120.

Persons scoring below 70 are not currently subject to induction under the Selective Service Act. Such persons are usually illiterate, and typically have much difficulty in adapting to military life. Some 7% of any adult age group will score below this point.

Only 16%, or one out of six men score above 120. However, it is a relevant fact that four out of five college graduates exceed this score—even though the test is taken before entering college! Now since practically all scientists, doctors and professional men are persons who stood in the upper half of their college graduating class, we can see at once that this upper region, representing scores of say, 135 or above, contains a small but very important segment of our population, although amounting to but 5% to 10% of the total population of any age group. It is from this segment of our manpower distribution that the nation must recruit practically all of its research workers, scientists and other specialized and professional personnel.

It is true that a man with a score of 135 or above can become a good soldier. It is also true that he owes as much to his country as the lad with a score of 80 to 110. But, can we as a nation, faced with the necessity of developing and maintaining our technological and military supremacy, afford to utilize these two men in the same manner? These facts concerning differences in human ability must be allowed for if we are not to squander one of our most precious national resources. We doubt that a nation can afford to have certain young men spend two years in military service if the same nation is likely to need them even more a few years later as high level specialists in either a military or civilian organization.

These are the facts to which our Committees wish to call your attention as demanding consideration in arriving at wise policy decisions concerning manpower utilization.

The Line of Thought

By CHARLES E. ODEGAARD

*Executive Director,
American Council of Learned Societies*

►OUR discussions quickly brought to the fore three major considerations. First, there were two phases to the problem of proper handling in the national interest of scientific, professional and specialized personnel, the training phase and the utilization phase, but these are directly related.

Second, any plan should be capable of adjustment to meet varying degrees of national emergency from a small military force in being, to a large standing army, or a full-scale war. Even in full-scale mobilization, there will continue a need for selection for different kinds of service which set up different requirements in training which even during war will have to be provided.

Third, Uncle Sam can no longer advisedly play the role of Mr. Big. In sheer manpower he cannot match the Soviet Eurasian giant. Our ultimate defense rests in the skill with which we use ourselves. Our manpower plan should respect the fact that our nation must now fight as a whole with everyone obligated to service, yet the civilian and military must be knit into one articulated plan. National defense is now more than a military affair. Both essential military and civilian activities are dependent as never before upon a wide variety of highly developed skills and knowledge. Yet there is still a dangerous tendency to think of manpower as though it were made up of identical and interchangeable units, a tendency which obscures the many kinds of service necessary to national defense and the human variations in capacity to render these services.

The committees assert that it is now an absolute requirement for the safety of the nation that our manpower plan provide for the maximum use of highly trained manpower as an important component of defense itself. The training of such persons is, therefore, not to be viewed as a privilege for the individual but as a national necessity. How much provision should be made is a matter for determination according to the absolute necessities of the moment.

Proposals affecting the training of specialized manpower fall into a limited number of possibilities. There is first the idea which can hardly have many defenders, that there should be no induction of college students.

Far more serious is the proposal that all undergraduates should be subject to induction on the theory that after 21 months or some such period they could return to college for training. Mr. Conant's recently announced proposal covering the induction of the entire 18- and 19-year-old age groups is a variant of this theme. Even assuming that this plan would produce

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Published by

Science Service, Washington, D. C.

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ASTRONOMY

Venus in Evening Sky

Bright and beautiful planet joins the bright stars of January. Is visible for about an hour after the setting of the sun. Can be seen before dark.

By JAMES STOKLEY

► **THOUGH** it does not show on the accompanying maps of the evening skies, the brilliant planet Venus is now coming into view after an absence of many months. During January it sets about an hour after the sun, actually before the end of evening twilight. However, it is so bright (magnitude minus 3.4 on the astronomical scale) that it can easily be seen low in the southwest even before darkness has fallen completely. It is slowly drawing away from the sun, toward the east, so in the coming months it will be setting later and later, thus becoming more and more prominent.

Our maps depict the appearance of the heavens at the beginning of January at about 10.00 p. m. your own kind of standard time, if you are located close to the central meridian of your time belt. These are the meridians marking 75 degrees west longitude for the Eastern time zone, 90 degrees for Central time, 105 degrees for Mountain time and 120 degrees for Pacific time. For observers well to the east of these meridians, the stars would be arranged as shown up to half an hour earlier, while those in the western parts of the time zone would get the same appearance a half hour or so later than 10:00 o'clock.

Because our time is based on the sun which moves eastward through the stars, they seem each evening to slip westward a little for the same time by the clock. By the middle of January, the maps will show the skies an hour earlier than they did at the start. They will be two hours earlier by the close of the month.

Another planet, however, almost gets on our maps. This is Jupiter, nearly five times fainter than Venus, but still brighter than any other star or planet. It sets around 8:30 at the middle of January and is in the constellation of Aquarius, the water-carrier. After the time for which the maps are drawn, a little before eleven, the planet Saturn rises in the east in the constellation of Virgo. Its brightness is about that of a typical first magnitude star.

Mars also is in the evening sky, in Capricornus, the same as Venus, and sets about an hour later than that planet. However, it is now so faint, because of its great distance from earth, and is so low, that it will be hard to find. The last of the five naked-eye planets, Mercury, is now in Sagittarius, the archer, which rises just ahead of the sun in the east. Around Jan. 23, when it is farthest west of the sun, it

may be possible to get a glimpse of this planet low in the southeast before sunrise.

As for the stars of January evenings, the winter constellations are now shining with their full glory. Brightest is Sirius, the dog-star, seen in the southeast in Canis Major, the great dog. Above and to the right is Orion, the warrior. Betelgeuse and Rigel are the two brightest stars in this figure, while between them are three stars in a row that form his belt.

Still higher and farther west is Taurus, the bull, with first-magnitude Aldebaran marking his eye. Capella, in Auriga, the charioteer, stands directly overhead. Moving downwards toward the east, we come to the twins Gemini, of which Pollux is the brightest star. Between Gemini and Canis Major is Canis Minor, the lesser dog, with the star Procyon.

In addition to these stars, two others of the first magnitude are shown, though they are so low that their light is considerably dimmed. Low in the east is Regulus, in Leo, the lion, which will be coming into better view during the coming months. On the other hand Deneb which is about all of Cygnus, the swan, that remains visible in the northwest, is about to disappear for a while.

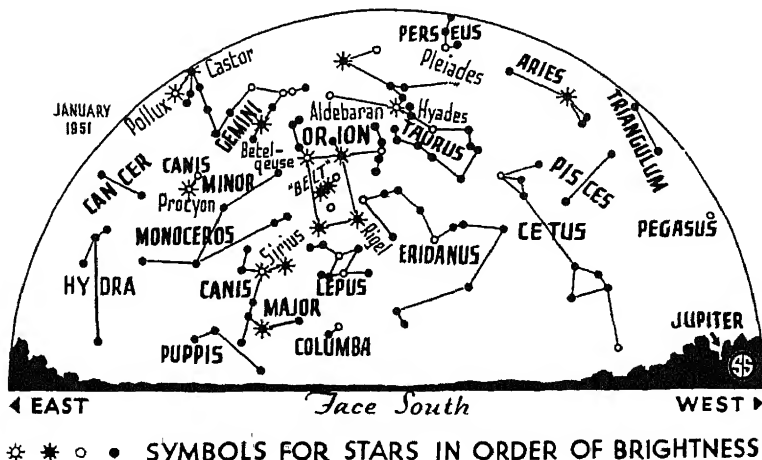
Of all the stars in the sky, except the sun, the brightest is Sirius, the dog-star, which now shines so brightly in the southeast. In its intrinsic brightness, or candlepower, it exceeds the sun by about 21 times. Many stars are far more brilliant than this. The reason Sirius looks so bright is because it is so close. While there are six stars, again excepting the sun, which are

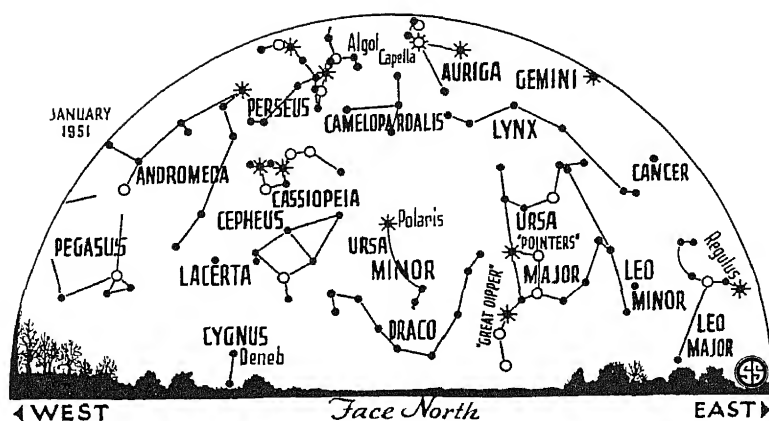
even nearer, four are so faint that a telescope is needed to show them despite their proximity. The other two are not visible from most of the United States, as they are from more southerly countries, so that Sirius actually is closest of the stars we normally see. Its distance is 8.7 light years, equal to about 52,000,000,000,000 miles—the length that a light beam will cover in 8.7 years, going 186,000 miles each second.

Over a century ago a German astronomer, named Bessel, plotted the movement of Sirius across the sky, which is fast enough to take it the space of the full moon's diameter in 1200 years. Bessel found that it did not move in a straight line, but swung first to one side, then to the other. This immediately suggested that there was not one star, but two, moving around each other, and that it was the center of gravity of the system that moved in a straight line. His prediction of such a companion was confirmed in 1862 when Alvan Clark, Jr., a Massachusetts telescope maker, happened to look at Sirius through a new telescope just completed for a Chicago observatory. The companion was revealed for the first time. Later studies have shown that the period of revolution of the two bodies is a little under 50 years.

Though Sirius is some 10,000 times as bright as its companion, the two are nearly the same color. This means that each is giving off a similar amount of light per square mile of surface. The only way for the companion to be so faint is for it to be much smaller than Sirius, and it turns out to be about the size of the planet Uranus. Yet, from the way it revolves around Sirius, its mass may be calculated, and it turns out to contain about the same amount of material as the sun does.

Since the diameter is about a thirtieth that of the sun, its actual volume is only about 1/27,000th, and with the same





amount of matter concentrated in so small a space, its density must be extraordinarily great. The old rule of "A pint's a pound, the world around," does not hold there! A pint of the stuff of Sirius B, as the companion is designated, would weigh about 20 tons.

Perhaps even more extraordinary is the fact that this superdense material is not even solid, but is a gas. Fortunately, however, modern atomic theory gives us an idea of how this might be. An atom, like the solar system, consists mostly of empty space. There is a nucleus around which, at various distances, are moving a number of electrons. Dr. R. S. Richardson, of the Mt. Wilson Observatory, compares atoms to a number of men, each of whom has a heavy weight on the end of a string, which he is rapidly whirling around his head. While they do this, the men could hardly approach each other very closely, but if the strings should break and the weights fly off, then the men could crowd very near together.

This is believed to be what has happened to the atoms in Sirius B and in other "white dwarf stars," some of which are nearly a thousand times as dense. With atoms tripped of their electrons, the nuclei (which have most of the mass), can come many times closer together. They may still be separated enough for them to move around freely and thus have the properties of a gas.

Celestial Time Table for January

Jan	EST	
1	12:11 a.m.	Moon in last quarter
6	8:00 a.m.	Moon nearest, distance 223,500 miles
7	3:10 p.m.	New moon
8	6:27 p.m.	Moon passes Venus
11	7:31 a.m.	Moon passes Jupiter
14	7:23 p.m.	Moon in first quarter
17	11:27 p.m.	Algor (variable star in Perseus) at minimum
18	9:00 a.m.	Moon farthest, distance 251,900 miles
20	8:16 p.m.	Algor at minimum
22	11:47 p.m.	Full moon
23	5:05 p.m.	Algor at minimum
	11:00 p.m.	Mercury farthest west of sun
27	11:29 p.m.	Moon passes Saturn
30	10:13 a.m.	Moon in last quarter

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, December 30, 1950

ARCHAEOLOGY

Find Ancient Camp Site About 12,000 Years Old

➤ DIGGING deep in the icy soil of northern Alaska, Robert J. Hackman, a U. S. Geological Survey worker, found remains of a camp site where prehistoric Americans bivouacked some 12,000 years ago.

The discovery was announced in Washington by the Smithsonian Institution, which has received from Mr. Hackman a considerable collection of stone points, work of the ancient people.

The collection includes lamellar flakes and burins similar to those found by Dr. J. L. Giddings, of the University of Pennsylvania, under seven feet of soil on Cape Denbigh. The Giddings finds are considered the oldest work of man in the New World and resemble the work of Stone Age man in the Old World. The new collection was found buried about ten inches deep in Anaktuvuk Pass through the Brooks Range in northern Alaska.

A similar find was made independently at about the same time by William Irving, a student at the University of Alaska. Mr. Irving's discovery was made not far from

Mr. Hackman's, and it was also probably remains of a bivouac on the trail taken by the first Americans from the Alaskan coast to the interior of the North American continent.

In addition to the flakes like the Cape Denbigh culture, the Hackman collection includes some Folsom-like points which link this ancient people to ancient man in the United States Southwest. There were also points of unique design.

Unfortunately, no organic matter was found with the stone points that could serve to date them by the radioactive carbon calendar method. Antiquity of the specimens was calculated from study of the geology of the site and the style of workmanship of the points.

Another Geological Survey worker, Milton C. Lachenbruch, found two Folsom points near the headwaters of the Noatak River, just beyond the Brooks Range. This site was probably a third bivouac in the great migration.

Science News Letter, December 30, 1950

PUBLIC HEALTH

Cholera in India Not Alarming in U. S.

➤ A CHOLERA outbreak in India "does not make news" to health authorities in the United States, Dr. G. L. Dunnahoo, director and chief of the foreign quarantine division of the U. S. Public Health Service, commented on reports that the disease is attacking hundreds of thousands on a pilgrimage to the village of Rantali in eastern India.

Cholera is always smoldering in India. World Health Organization has been getting reports of four to eight thousand cases weekly for months.

When cholera jumps a thousand miles, as it did in the Egyptian outbreak in October, 1947, it is news to health authorities as well as the general public. But the chances of it spreading to the United States are very slim. One or two cases might come in by plane. U. S. quarantine officers, however, are stationed at international airports here to guard against just that happening. Passengers from regions where cholera exists must be vaccinated. If in spite of this a case is found on a plane or boat arriving in the United States, passengers and crew are held in quarantine for five days. This is the length of time it takes cholera to develop.

The disease spreads through contaminated drinking water, food and eating utensils. Vaccination is the weapon used to check outbreaks.

Chloromycetin and other antibiotic drugs and sulfa drugs have all been tried as remedies, but none has been an unqualified success.

Science News Letter, December 30, 1950

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From Page 422

sufficient manpower for the military, and that this mass levy of relatively untrained manpower along with the regulars and the reserve components could meet for some years in succession the military *varied* manpower requirements for a force in being, assumptions which certainly require closer scrutiny, the committees cannot accept this proposal. The nation is already faced with a serious shortage of scientific, professional and specialized personnel. Full-scale induction of college students and the 18- and 19-year-old age groups, would virtually stop for a period of at least two years the production of critical scientific, professional and specialized personnel. Furthermore, many of those entering military service might not have opportunities to return to institutions of higher learning for further training if an intensification of the emergency resulted in a prolongation of their term of military service. The committees have little confidence that any moral commitments to release men after two years service can be effective after they have once been trained for military duty. One can easily imagine the pressures which would work to keep these men in uniform on military duty when they constitute already the force in being. The committees believe this proposal constitutes a great danger to national security.

Furthermore, the proposal to induct entire age groups emphasizes a principle opposite to the principle that in this crisis each person should serve where he can best contribute. If this principle is once established it would almost inevitably be extended to all age groups and tend to withdraw specialized personnel from industry, education and the government at the very time when the need for these persons is more crucial than it has ever been.

If there were a mass levy of age groups the very necessities of the situation would soon require the return of some of them to college for training. If so, the problem of selection for further training still has to be met (indeed, it is one from which we cannot escape). Is it best to burden the military organization with the educational problems more familiar to the civilian university, and is it best to ask the military to determine entirely the programs of training to be pursued when civilian as well as military components are now fully involved in defense?

What—other alternatives are there? We might select among age groups certain individuals whose active service in the national interest is postponed during a period of training. The common denominator in some of these proposals is that those students who are preparing for “essential” sciences and professions should be permitted to continue their training.

However, there are the difficulties—and the dangers—in identifying in any rigorous way the essential sciences or fields of spe-

cialization as the bases for deferment. If one knew the exact character of the particular emergency which the Nation might face at a given period in the future, one might hazard some guesses as to essential fields—but then one would also have to know the nature of coming developments in the sciences themselves. Fifteen years ago nuclear physicists and professors of Japanese language would have been dismissed as a luxury. Such proposals are to be viewed as somewhat irresponsible until their proponents are willing to state and document the essential fields of learning and the nonessential. The very list would form the shape of things to come, largely extinguishing some fields of knowledge or stopping their growth, and predetermining the lines of the nation's scientific and cultural development. It will also predetermine the sciences and skills available to us for our defense. The nation which has guessed wrong could easily be all wrong if this policy is followed.

The committees are convinced that highly specialized persons, to be useful in the national welfare and defense, need in addition to their specialty a broad basis of knowledge. This, with intelligent imagination and specialized competence, enables men to meet new situations and to devise new techniques of control. Loss of adaptability will come inevitably with a narrow range of training, and the nation cannot now afford to lose ingenuity in planning and research.

Science News Letter, December 30, 1950

The Plan

➤ THE COMMITTEES' recommendations to General Hershey were divided into two parts, training and utilization.

Under training, they recommended a special classification for students. Young men could enter this classification provided they received higher than a to-be-determined cut-off mark on a national college aptitude test. (Equivalent of 120 on the Army General Classification Test has been suggested.) They could stay in throughout college if, within the group at the registrant's college of so-deferred men, they stayed above a rank to be determined (90% after freshman year, 95% after other years has been suggested.) Checks on continuance of good work would be made on graduate students.

At the end of training, the registrant would be liable for military duty even though he had passed statutory draft age.

Under utilization, they recommended that a graduated student should hold such classification for four months after graduation. If he gets an essential job utilizing his training, he can then be deferred for reasons of the national health, interest or safety. Other draft age men of similar training could qualify for deferment in the same way.

They also recommended setting up in Selective Service special advisory committees in major areas of training. The committees would advise Selective Service on specialized personnel needs of civilian and

military and make recommendations to local and appeals boards. The committees would also define functions within their fields and needs for specialized personnel.

Science News Letter, December 30, 1950

Training

By HENRY A. BARTON

Director,
American Institute of Physics

➤ ANY PLAN for training specialists must recognize the need for military manpower. This means that only a limited number of persons can be channeled into the lengthy courses of training required by modern specialization. This limited number will have to be selected.

If there is to be war, it will probably be a short war only if we lose. It is inevitable that provision for training specialists will have to be made eventually no matter what plans are adopted for national service for youth. Any such provision will involve selection. Our mandate was to propose a plan which could operate through the Selective Service System. Our plan is designed to achieve three major objectives:

1. To postpone the period of service in the national interest of selected individuals in order to prepare them for those responsibilities which require education and training.

2. To select for such education and training those individuals whose demonstrated aptitude offers a high probability that they will successfully achieve the competence which the nation requires.

3. To provide a system in which the number so postponed may be flexibly adjusted to produce the optimum balance between the immediate needs for military manpower and the longer term needs of

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both civilian and military activities for specialized manpower.

We believe that an adequate minimum flow of specialists in the sciences, engineering, and other fields can be provided by this procedure. It is presumed that an R. O. T. C. program in the colleges will be continued. Also, a certain percentage of young men of college age will not satisfy physical requirements for military service. Neither of these groups would be subject to Selective Service. Of the remaining young men subject to Selective Service and who would expect to go to college, a minimum score of 120 would screen out well over half of these. If at the end of the freshman year 90% of these selected individuals were continued into the sophomore year, 95% of the sophomores continued into the junior year and 95% of the juniors continued into the senior year, about 65,000 young men in this class would graduate from each age group. This would be a small number. However, it is our hope that the productivity of this selected group will be at a high average.

This plan will provide the desired flexibility. Adjustments can be made by adjustment of the cutting score and the percentage carried over from year to year. No legislation is necessary to provide authorization for this procedure.

We not only recognize, but call attention to, the fact that opportunities to go to college have not been available heretofore, nor are they now to all elements of our population. However, this is a social problem which the nation must solve. The committees do not believe that an unwise manpower and Selective Service policy should be adopted because of an inadequate national policy with regard to the distribution of educational opportunity.

Science News Letter, December 30, 1950

Utilization

By ALEXANDER C. MONTEITH

Vice President, Westinghouse Electric Corporation

► THE TRAINING program will only be of lasting value to the nation if such highly selective and trained manpower is properly utilized.

Basically behind these deliberations is the full realization that these young men, trained in qualified institutions, are our only long range supply of technical, professional, and specialized leadership.

It therefore becomes clear that if we are to face years of preparedness, rapid development and careful conversion of such personnel is imperative.

The pool of men includes those men who have completed their training some time in the past and, too, who are becoming available through the completion of current training.

Four months should be sufficient to allow for transition from academic life to an

occupation which affords the beginnings of professional life. Reclassification implies that these men in common with others will be subject to general military service unless there is a higher priority for their services in other essential activity.

The registrant or his employer must prove that his training is not just utilized but in an essential activity as well.

During the past three years we have experienced the largest college graduation in history. This reservoir of trained men should be looked upon as indispensable. Thousands of these young men who have entered their professional life since World War II are already contributing constantly to highly essential activity.

As an example in Westinghouse in War Specification Technical Department, whose work is totally on the development of secret military apparatus, 85% of the professional manpower, 67 out of 79, completed their formal education since 1946 and the majority are under 26 years of age. In addition rapidly changing circumstances have rendered the existing classification of numerous registrants obsolete. A review of the classification of trained registrants is currently in order to prevent dissipation of selective manpower.

We view the creation of an advisory committee as a major step in favoring the effective administration of our highly successful selective service system.

Each group of experts forming an advisory committee will continuously survey the essential industries and occupations within its field and advise the local and appeal boards. Guidance, current and authentic, is thus provided in the National Headquarters structure.

Science News Letter, December 30, 1950

GENERAL SCIENCE

Compulsion Doesn't Cancel Individual Responsibility

► DR ALBERT EINSTEIN believes that "external compulsion can to a certain extent reduce but never cancel the responsibility of the individual."

Discussing how a person should act if his government prescribes actions which his own conscience considers wrong, Dr. Einstein made a statement to the Society for Social Responsibility. (SCIENCE, Dec. 22).

"It is easy to say that the individual cannot be held responsible for acts carried out under irresistible compulsion," Dr. Einstein said, "because the individual is fully dependent upon the society in which he is living and therefore must accept its rules."

"Institutions are in a moral sense impotent unless they are supported by the sense of responsibility of living individuals," Dr. Einstein observed.

In our times scientists and engineers carry particular moral responsibility, he said.

Science News Letter, December 30, 1950

ORNITHOLOGY

NATURE RAMBLINGS



Snowbirds

► WHEN icicles hang from their tail feathers, the tiny tumbling birds of winter are in their element. Let the big, honking geese, the toothsome mallard, the strutting robin fly far to the south to palmlands under tropical suns. Snowbirds do not flee the wintry blasts. They revel in blizzards, sing in sleet, sweep snow-covered fields in open defiance of the coldest weather.

The name snowbird has been applied rather indiscriminately to a large number of small winter birds of gray, brown and white. Sparrows and finches, chickadees and nuthatches stay with us from the time of red leaves until the first white flowers of spring. From polar islands north of Alaska and Hudson Bay come the snow buntings, or snowflakes, to haunt snow-swept hillsides or bleak and ice-covered shores. Wherever are cool summers and freezing winters, there are slate-colored juncos, true birds of winter and one of the most common sparrows in America.

These hardy Vikings will spend the coldest months of the year flying over white-coated fields and lawns or clinging to weed stalks which stick up through the snow. It is the weed stalks which give clue to the snowbirds' presence. Without such remnants of harvest crop and garden, ditches and field-corners, the birds could not live through the winter.

Their appetites are highly beneficial to the farmer, for they consume vast quantities of weed seeds. They also gobble harmful insects, eating caterpillars by the droves. The amazing acrobatics of the nuthatcher and chickadee are performed as they search inch by inch over bark and twigs for the sleeping eggs and pupae of the next summer's borers and biters.

Any and all snowbirds are glad for occasional human assistance, however, in warding off winter's hunger. Crumbs from feast-day tables are banquets for them. A lump of suet nailed to a post or limb (with a tin guard beneath it to keep away the cat, an incorrigible heathen even at Christmas) is a veritable barbeque.

Given an occasional helping hand when the snow is deep and even the thermometer

hivers, the little snowbirds will ride your outdoor Christmas trees all winter. Naturalist John Burroughs said of the white snow-bunting:

"A winter bird that really seems a part of winter, that seems to be born of the whirling snow, to be happiest when storms drive thickest and coldest. Its twittering call and chirrup coming out of the white

obscurity is the sweetest and happiest of all winter sounds. It is like the laughter of children. The fox-hunter hears it on the snowy hills, the farmer hears it when he goes to fodder his cattle, the country schoolboy hears it as he breaks his way through the drifts toward the school. It is ever a voice of good cheer and contentment."

Science News Letter, December 30, 1950

Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D.C. Ask for free publication direct from issuing organizations.

AN ANNOTATED CHECKLIST AND KEY TO THE REPTILES OF MEXICO EXCLUSIVE OF THE SNAKES—Hobart M. Smith and Edward H. Taylor—*Gov't. Printing Office*, U. S. Nat'l Museum Bull. 199, 253 p., paper, 75 cents. A systematic treatise.

BEESWAX. Its Properties, Testing, Production and Applications—Huber H. Root—*Chemical Publications Co.*, 154 p., illus., \$4.75. Explains the origin and nature of beeswax.

THE CHEMICAL FORMULARY. A Collection of Valuable, Timely, Practical, Commercial Formulae and Recipes for Making Thousands of Products in Many Fields of Industry, Vol. IX—H. Bennett, Ed.-in-Chief—*Chemical Publishing Company*, 648 p., \$7.00.

CUTWORMS, ARMYWORMS, AND RELATED SPECIES ATTACKING CEREAL AND FORAGE CROPS IN THE CENTRAL GREAT PLAINS—H. H. Walkden—*Gov't. Printing Office*, U. S. Dept. of Ag. Circ. No. 849, 52 p., illus., paper, 20 cents.

THE DEVELOPMENT OF FUNDAMENTAL CONCEPTS IN THE SCIENCE OF GENETICS—Ernest B. Babcock—*American Genetic Association*, 50 p., paper, 60 cents.

DICTIONARY OF FOLKLORE, MYTHOLOGY AND LEGEND, Vol. II J-Z—Maria Leach, Ed.—*Funk and Wagnalls*, 662 p., \$7.50.

EPIHEMERIS OF THE SUN, POLARIS AND OTHER SELECTED STARS WITH COMPANION DATA AND TABLES FOR THE YEAR 1951—Donald B. Clement—*Gov't. Printing Office*, 42nd ed., 30 p., illus., paper, 20 cents. Astronomical data are presented.

EXPLORATIONS IN ALTRUISTIC LOVE AND BEHAVIOR: A Symposium—Pitirim A. Sorokin, Ed.—*The Beacon Press*, 353 p., illus., \$4.00.

A volume from the Harvard Research Center in Altruistic Integration and Creativity. Among the authorities contributing to this symposium are Pitirim A. Sorokin, M. F. Ashley Montagu and Gordon W. Allport.

FROM ATOMS TO STARS—Martin Davidson—*Hutchinson's* (U. S. distributor Macmillan), 188 p., illus., \$2.70. Provides a general outline of up-to-date knowledge of heavenly bodies.

GOOD SCHOOLS DON'T JUST HAPPEN!—Federal Security Agency, Office of Education—*Science Research Associates*, 25 p., illus., paper, 10 cents; free to educators. A booklet to help improve our schools.

A HANDBOOK OF SPACE FLIGHT—Wayne Proell and Norman J. Bowman—*Perastadion Press*, 185 p., \$3.50. Tables on physical, chemical and astronomical data are presented.

MARKET RESEARCH SOURCES: A Guide to Information on Domestic Marketing—Lois E. Randall and Dorothy M. Sharpnack—*Gov't. Printing Office*, 261 p., \$2.25.

MINUTES TO MIDNIGHT: The International Control of Atomic Energy—Eugene Rabinowitch, Ed.—*Bulletin of the Atomic Scientists*, 128 p., illus., paper, \$1.00. Includes United Nations Atomic Energy Commission reports and speeches by Acheson, Lilienthal, Briuch, Vishinsky and others.

THE OAK RIDGE STORY: The Saga of a People Who Share in History—George O. Robinson, Jr.—*Southern Publishers*, 181 p., illus., \$3.50. The story of the development of Oak Ridge into one of the leading atomic research centers.

ON THE POSITIVE SIDE: An Account of the Accomplishments of Mental Hospitals in Canada

and the United States as shown by their applications for the American Psychiatric Association Mental Hospital Achievement Awards in 1949 and 1950—*American Psychiatric Association*, 42 p., paper, 50 cents.

OUR DESERT NEIGHBORS—Edmund C. Jaeger—*Stanford University Press*, 239 p., illus., \$5.00. The author's experiences with the creatures of the desert wilderness. Well illustrated with black and white photographs.

PLATO WEAVES THE VERBAL VEIL, Vol. II of The Historic Approach to the Theory of Relativity—Mary Milbank Brown—*J. J. Augustin*, 279 p., \$4.00. Some background material on the development of the theory of relativity.

RELATIVITY: A Richer Truth—Philipp Frank—*The Beacon Press*, 142 p., \$2.00. Some of the moral, ethical and political implications of modern science are discussed. Foreword is written by Albert Einstein.

REPORT ON A COLLECTION OF BIRDS FROM GUERRERO, MEXICO—Emmet R. Blake—*Chicago Natural History Museum*, 18 p., paper, 25 cents.

REPORT ON A COLLECTION OF BIRDS FROM OAXACA, MEXICO—Emmet R. Blake—*Chicago Natural History Museum*, 24 p., paper, 25 cents.

A SELECTED AND ANNOTATED BIBLIOGRAPHY OF RECENT SOURCES OF INFORMATION ON THE INDUSTRIALIZATION OF TEXAS—Stanley A. Arbingast and Marshall A. Beasley—*The University of Texas*, 15 p., paper, free upon request to publisher, College of Business Administration, Austin 12, Texas.

SEQUOIA NATIONAL PARK: A Geological Album—Francois E. Matthes—*University of California Press*, 136 p., illus., \$3.75. A pictorial volume containing nontechnical annotations which interpret the geologic evidence illustrated.


SITES OF THE RESERVES PHASE-PINE LAWN VALLEY, WESTERN NEW MEXICO—Paul S. Martin and John B. Rinaldo—*Chicago Natural History Museum*, 174 p., illus., paper, \$3.00. A report of an archaeological excavation.

SIZES OF FARMS IN THE UNITED STATES—Kenneth L. Bachman and Ronald W. Jones—*Gov't. Printing Office*, U. S. Dept. of Ag. Tech. Bull. No. 1019, 79 p., illus., 25 cents. Science News Letter, December 30, 1950

Wide usage of acorns as human food prevailed during pioneer days; meal from them was leached with hot water to remove the tannic bitterness.

ERRATA, Vol. 58, Nos. 1-27, July-December, 1950

PAGE	TITLE BEGINS	CORRECTION
85	Winter Shots	Par. 6, read Dr. Martin has moved to Winnipeg. Delete remainder.
118	Tin	Par. 6, line 8, Zurich for Vienna.
121	BW, Wartime Weapon	Par. 3, lines 4, 5, read "in Veterinary Medicine (Aug.)."
126	Planes Should Have	Col. 2, line 5, Rentzel for Rentzell.
174	Nature Ramblings	Col. 2, line 7, animal phylum for great order.
259	Rabbit Fever	Par. 3, line 3, after Jellison insert and Glen M. Kohls; line 7, delete and Glen M. Kohls. Par. 4, line 4, read between 1945 and 1949, for during the past year.
260	Rabbit Fever	P. 260, line 3, three for two.
285	Indians Antedate	Col. 2, line 7, Willard for William.
285	Malaria Cure	Par. 2, line 6, after all insert but one.
296	Women in Homes	Par. 3, line 2, delete annual.



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⚙️ **CONVERTIBLE SHOE** with removable sole, recently patented, permits the owner to change from a light to heavy sole almost instantly. The shoe and the soles are manufactured separately. They are attached or separated easily by a special locking device.

Science News Letter, December 30, 1950

⚙️ **CASEMENT WINDOWS** for houses are cast in a single unit and have no welded or other joints. Casting in this form is made possible by a new type of permanent mold. Increased strength and rigidity is one advantage while rounded corners make cleaning easier.

Science News Letter, December 30, 1950

⚙️ **BUSINESS-FORMS MACHINE** permits copy to be typed and lines to be ruled as needed on one-page forms for records, tabulated reports and other matters. The machine rules single or double lines either horizontally or vertically as well as dots and dashes.

Science News Letter, December 30, 1950

Do You Know?

Roses, berry bushes and broadleaf evergreens need protection from winter conditions by late-fall *mulching*.

"Pigeon's milk," the first food of the newly hatched dove which it gets from the parent's mouth, is an actual form of milk secreted in the crop of the adult bird.

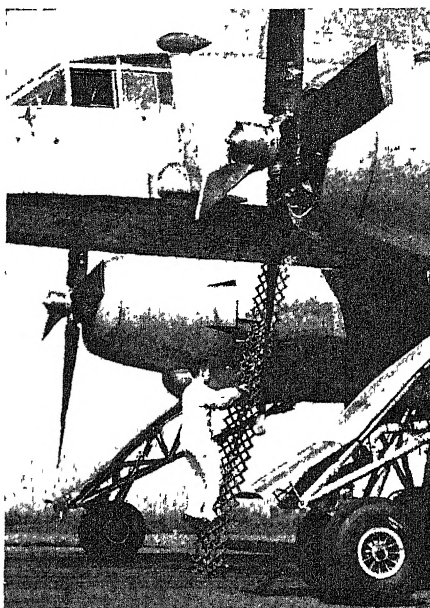
When an *atomic bomb* explodes, the characteristic cloud created reaches an altitude of 10,000 feet in about four-fifths of a second.

New York City Police Department, which has three *helicopters*, has used them to save many lives in the harbor and nearby waters during the past two years.

The number of persons needed to operate *Loran stations*, which enable mariners at sea to get their geographical location by radio waves, has been cut to half by new automatic equipment.

Korea, in 1948, ranked second among the shippers of *tungsten ore* to the United States, sending over 3,500,000 pounds.

High-frequency sound waves are sometimes used to scare away birds and rats; the frequency used is too high to register as sound in the human ear.



⚙️ **ROLLER PAINT-APPLIER**, recently patented, eliminates the dripping that sometimes comes from similar devices. The roller that spreads the paint is fed by another roller that gets its supply direct from the paint container.

Science News Letter, December 30, 1950

⚙️ **MECHANICAL PENCIL** carries a two inch wide, 36-inch long roll of memo paper in its barrel. When the pencil is twisted the end of the roll appears and as much of the paper can be pulled out as needed. Refills are available. The pencil can be used to hold a roll of postage stamps if desired.

Science News Letter, December 30, 1950

⚙️ **VOICE AMPLIFIER**, a portable 1.5 pound public address system easily carried all day with a shoulder strap, is designed for a guide or instructor escorting a party on indoor or outdoor trips. Complete with battery, the amplifier is attached by cable to the microphone.

Science News Letter, December 30, 1950

⚙️ **COLLAPSIBLE LADDER** can be folded into a portable three-foot package easily carried by one man, although it is 15 feet long when expanded. Built on the principle of a collapsible gate, it is shown in the picture in use on the runway of the airplane company that developed it.

Science News Letter, December 30, 1950

⚙️ **COVER CLOTH** for interior painters and paperhangers is made of plastic sheeting that resists paint and chemicals and will not flash or support combustion. Paint on after drying, can be shaken off and the entire cloth can be cleaned with a damp rag.

Science News Letter, December 30, 1950

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